
**© THE QUEEN'S PRINTER FOR
ONTARIO
2000**

REPRODUCED WITH PERMISSION

**L'IMPRIMEUR DE LA REINE POUR
L'ONTARIO**

REPRODUIT AVEC PERMISSION

micromedia
a division of IHS Canada

20 Victoria Street
Toronto, Ontario M5C 2N8
Tel.: (416) 362-5211
Toll Free: 1-800-387-2689
Fax: (416) 362-6161
Email: info@micromedia.on.ca



ONTARIO GEOLOGICAL SURVEY

Open File Report 6003

Report of Activities, 1999
Resident Geologist Program

Red Lake Regional Resident Geologist Report:
Red Lake and Kenora Districts

by

P. Hinz, C.C. Storey, S.D.M. Gosselin, C.C. Blackburn and L. Kosloski

2000

Parts of this publication may be quoted if credit is given. It is recommended that reference to this publication be made in the following form:

Hinz, P., Storey, C.C., Gosselin, S.D.M., Blackburn, C.C. and Kosloski, L. 2000. Report of Activities 1999, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts; Ontario Geological Survey, Open File Report 6003, 66p.

© Queen's Printer for Ontario, 2000.

Open File Reports of the Ontario Geological Survey are available for viewing at the Mines Library in Sudbury, at the Mines and Minerals Information Centre in Toronto, and at the regional Mines and Minerals office whose district includes the area covered by the report (see below).

Copies can be purchased at Publication Sales and the office whose district includes the area covered by the report. Although a particular report may not be in stock at locations other than the Publication Sales office in Sudbury, they can generally be obtained within 3 working days. All telephone, fax, mail and e-mail orders should be directed to the Publication Sales office in Sudbury. Use of VISA or MasterCard ensures the fastest possible service. Cheques or money orders should be made payable to the *Minister of Finance*.

Mines and Minerals Information Centre (MMIC) Macdonald Block, Room M2-17 900 Bay St. Toronto, Ontario M7A 1C3	Tel: (416) 314-3800 1-800-665-4480(toll free inside Ontario)
Mines Library 933 Ramsey Lake Road, Level A3 Sudbury, Ontario P3E 6B5	Tel: (705) 670-5615
Publication Sales 933 Ramsey Lake Rd., Level A3 Sudbury, Ontario P3E 6B5	Tel: (705) 670-5691(local) 1-888-415-9845(toll-free) Fax: (705) 670-5770 E-mail: pubsales@ndm.gov.on.ca

Regional Mines and Minerals Offices:

Kenora - Suite 104, 810 Robertson St., Kenora P9N 4J2
 Kirkland Lake - 10 Government Rd. E., Kirkland Lake P2N 1A8
 Red Lake - Box 324, Ontario Government Building, Red Lake P0V 2M0
 Sault Ste. Marie - 70 Foster Dr., Ste. 200, Sault Ste. Marie P6A 6V8
 Sioux Lookout - Box 3000, Queen and Fourth, Sioux Lookout P8T 1C6
 Southern Ontario - P.O. Bag Service 43, Old Troy Rd., Tweed K0K 3J0
 Sudbury - Level B3, 933 Ramsey Lake Rd., Sudbury P3E 6B5
 Thunder Bay - Suite B002, 435 James St. S., Thunder Bay P7E 6S7
 Timmins - Ontario Government Complex, P.O. Bag 3060, Hwy. 101 East, South Porcupine P0N 1H0
 Toronto - MMIC, Macdonald Block, Room M2-17, 900 Bay St., Toronto M7A 1C3

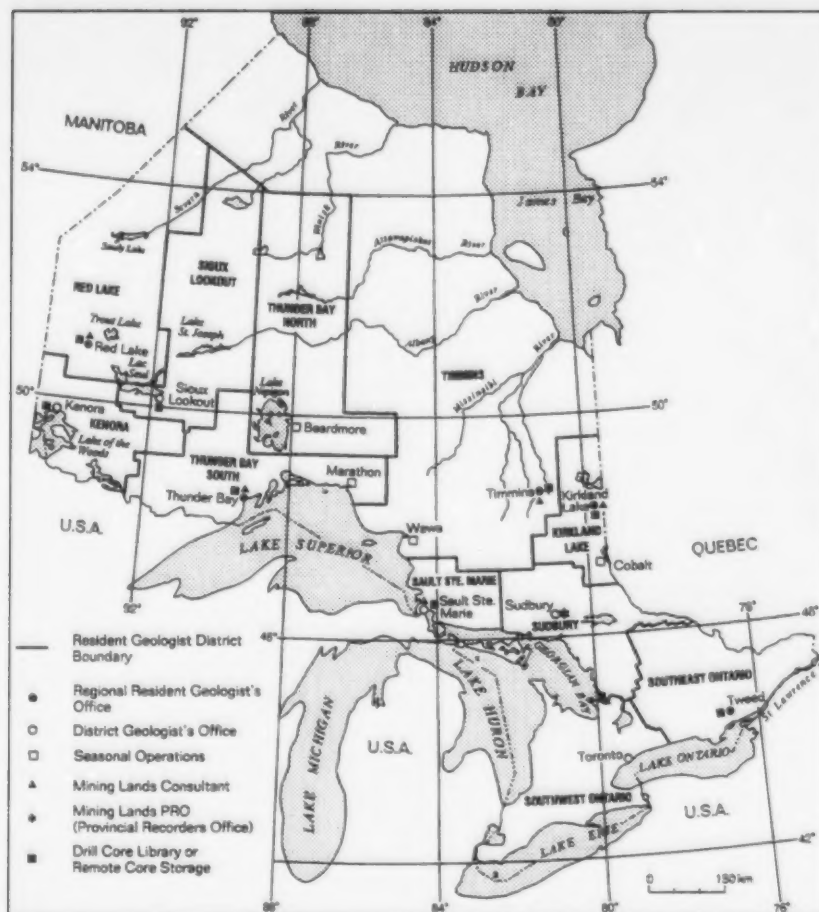
This report has not received a technical edit. Discrepancies may occur for which the Ontario Ministry of Northern Development and Mines does not assume any liability. Source references are included in the report and users are urged to verify critical information. Recommendations and statements of opinions expressed are those of the author or authors and are not to be construed as statements of government policy.

If you wish to reproduce any of the text, tables or illustrations in this report, please write for permission to the Team Leader, Publication Services, Ministry of Northern Development and Mines, 933 Ramsey Lake Road, Level B4, Sudbury, Ontario P3E 6B5.

Cette publication est disponible en anglais seulement.

Parts of this report may be quoted if credit is given. It is recommended that reference be made in the following form:

Hinz, P., Storey, C.C., Gosselin, S.D.M., Blackburn, C.C. and Kosloski, L. 2000. Report of Activities 1999, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts; Ontario Geological Survey, Open File Report 6003, 66p.



Mines and Minerals Division Regional & District Offices

CITY	ADDRESS	OFFICE(S)	TELEPHONE	FAX
Kenora	Suite 104, 810 Robertson St. P9N 4J2	○ ■	(807) 468-2813	(807) 468-2930
Red Lake	Box 324, Ontario Government Building 227 Howey Street P0V 2M0	● ■ ▲	(807) 727-3272 (807) 727-3284	(807) 727-3553 (807) 727-3553
Sioux Lookout	Box 3000, Queen and Fourth P8T 1C6	○ ■	(807) 737-2039	(807) 737-3419
Thunder Bay-North	Suite B002, 435 James St. S., Thunder Bay P7E 6S7	● ■ ▲	(807) 475-1331 (807) 475-1311	(807) 475-1112 (807) 475-1124
Thunder Bay-South	Suite B002, 435 James St. S., Thunder Bay P7E 6S7	● ■ ▲	(807) 475-1331 (807) 475-1311	(807) 475-1112 (807) 475-1112
Sault Ste. Marie	Suite 200, 70 Foster Dr. P6A 6V8	○ ■ ▲	(705) 945-6931 (705) 945-6925	(705) 945-6935 (705) 945-6935
Timmins	Ontario Government Bldg., P.O. Bag 3060, Hwy 101 East, South Porcupine P0N 1H0	● ■ ▲	(705) 235-1615 (705) 235-1800	(705) 235-1620 (705) 235-1620
Kirkland Lake	10 Government Rd. E. P2N 1A2	● ■ ▲	(705) 568-4516 (705) 567-9242	(705) 568-4515 (705) 567-5621
Sudbury	Level B3, 833 Ramsey Lake Rd. P3E 6B5	○ ◆	(705) 670-5735	(705) 670-5861
Tweed	P.O. Bag Service 43, 126 Old Troy Rd., K0K 3J0	● ■	(613) 478-3161	(613) 478-2673
Toronto	Mines and Minerals Information Centre, Room M2-17, MacDonald Block, 900 Bay St. M7A 1C3	○	(416) 314-3800	(416) 314-3797

**ONTARIO GEOLOGICAL SURVEY
RESIDENT GEOLOGIST PROGRAM
REPORT OF ACTIVITIES—1999**

RED LAKE REGIONAL RESIDENT GEOLOGIST REPORT

CONTENTS

1. Red Lake District
2. Kenora District



**Ontario Geological Survey
Regional Resident Geologist Program**

Red Lake Regional Resident Geologist (Red Lake District)—1999

by

C.C. Storey, S.D.M. Gosselin and L. Kosloski

2000

CONTENTS

Red Lake Regional Resident Geologist (Red Lake District)–1999

INTRODUCTION	1
MINING ACTIVITY	1
Placer Dome North America – Campbell Mine	1
Goldcorp Inc. – Red Lake Mine	2
Claude Resources Inc./Madsen Gold Corp. – Madsen Mine	4
EXPLORATION ACTIVITY	9
Red Lake Greenstone Belt	9
Birch-Confederation-Uchi Greenstone Belt	12
Northern Greenstone Belts	12
RESIDENT GEOLOGIST STAFF AND ACTIVITIES	17
Drill Core Storage Site	18
Land Use Planning	18
PROPERTY EXAMINATIONS	18
West Red Lake (C.C. Storey)	20
Gangloff Property-Heyson Township (S.D.M. Gosselin)	22
Capital Lithium Mines - Root Lake 34 Claim Group (C. C. Storey)	23
Consolidated Morrison Explorations Ltd. Pegmatite Road Reconnaissance. (C. C. Storey)	24
RECOMMENDATIONS FOR EXPLORATION	29
Rare-Metal Pegmatites	29
Gold	29
OGS ACTIVITIES AND RESEARCH BY OTHERS	29
REFERENCES	37

Tables

Table 1. Mine production and reserves in the Red Lake District in 1999.	2
Table 2. Assessment files received in the Red Lake District in 1999.	5
Table 3. Exploration activity in the Red Lake Resident Geologist District in 1999.	16
Table 4. Property visits conducted by the Red Lake Regional Resident Geologist and Staff in 1999	18
Table 5. Assay results from the West Red Lake property.	20
Table 6. Consolidated Morrison Reconnaissance samples	27
Table 7. Trace element analyses of Root Lake pegmatite area samples	27
Table 8. Precious and base metal assay results from the Root Lake pegmatite area.	28
Table 9. Major element analyses of pegmatite and potassium feldspar samples	28
Table 10. Element ratios for pegmatite and feldspar samples	28
Table 11. Publications received by the Red Lake Office in 1999.	30
Table 12. Mineral deposits not being mined in the Red Lake District in 1999.	33

Figures

Figure 1. Longitudinal section Goldcorp Inc. Red Lake Mine	3
Figure 2. Red Lake District (north part): exploration, property visits and OGS activity.	13
Figure 3. Red Lake District (south part): location map and exploration activity.	14
Figure 4. Red Lake greenstone belt: mining and exploration activity.	15
Figure 5. Birch-Confederation-Uchi greenstone belt: exploration activity.	15
Figure 6. Property examinations, OGS and other research activity	19
Figure 7. Gold prospects and deformation zones at the west end of Red Lake.	21
Figure 8. West Red Lake property.	21
Figure 9. Gangloff property, Heyson township, after Atkinson 1993.	22

Figure 10. Root Lake pegmatite area.	25
Figure 11. Capital Lithium Mines - Root Lake 34 Claim Group sample sites.	26
Figure 12. Consolidated Morrison Pegmatite road reconnaissance samples.	26

Photos

Photo 1. Tourmaline veins cutting basalt host and highly fractionated pegmatite.	25
---	----

RED LAKE REGIONAL RESIDENT GEOLOGIST (RED LAKE DISTRICT)–1999

C.C. Storey¹, S.D.M. Gosselin² and L. Kosloski³

¹Acting Regional Resident Geologist, Red Lake-Kenora, Resident Geologist Program, Ontario Geological Survey

²Acting District Geologist, Red Lake District, Resident Geologist Program, Ontario Geological Survey

³District Support Geologist, Red Lake District, Resident Geologist Program, Ontario Geological Survey

INTRODUCTION

Gold was the only commodity produced in 1999 in the Red Lake District. Placer Dome North America Inc. produced 262 015 ounces from the Campbell Mine in Balmertown, while Claude Resources Inc./Madsen Gold Corp. produced 18 499 ounces from the Madsen Mine in Madsen. There was no gold production at Goldcorp Inc.'s Red Lake mine, as the unionized employees remained on strike throughout 1999.

Underground exploration and development continued at the Red Lake mine, while advanced exploration by Madsen Gold Corp continued on their McVeigh zone at the Madsen mine and at the past producing Buffalo mine. This latter company also continued underground rehabilitation and exploration at the Madsen Mine. Madsen suspended mining operations at the end of October, to concentrate on surface and underground exploration of the Madsen Mine property.

Thirty-two exploration programs were conducted in the Red Lake District in 1999. The Red Lake and Birch-Confederation-Uchi lakes greenstone belts were the major focus of this activity. Large parts of these belts are either staked or held under patent or lease. Six projects were conducted with the financial assistance of the Ontario Prospectors Assistance Program (OPAP), using 6 grants totalling \$90,000.

Staff of the Red Lake Resident Geologist's Office made 24 visits to active and inactive mineral properties during the field season. Four of the properties examined benefited from financial assistance under the 1999 Ontario Prospectors Assistance Program (OPAP).

MINING ACTIVITY

Gold continues to be the only commodity mined in the Red Lake District (Table 1). Three mines in the Red Lake camp are currently in production or are carrying out underground exploration and development.

Placer Dome North America – Campbell Mine

The Campbell mine, located in Balmertown, in the Red Lake district, has produced over 9 655 157 ounces of gold to date. The mine has operated continuously since 1949 and employs 374 people. Campbell celebrated its 50th anniversary in July of 1999 (*The District News*, July 21, 1999, p.1).

The new 6000 ft (1830 m) Reid Shaft was commissioned in October, providing access to 1500 ft. (550 meters) of new levels. This allows improved efficiency in mining current reserves, development of reserves at depth and access for exploration 411 m below the developed mine. The cage can carry 50 men and the skips are capable of hoisting 2750 tons a day (*The Northern Miner*, October 4-8, 1999, p.1).

Placer Dome is currently focussing on development of reserves at depth and exploration for new gold zones. In 1999, the majority of the exploration was focused on the lower levels of the mine. An area southwest of the hanging wall, beyond the main mineralized system, was tested with reconnaissance drilling. Diamond drilling was carried out beneath the known ore zones, to test for new zones at depth. The Craibbe Fletcher and H.G. Young properties, and areas to the northwest of the mine have also been drilled from the upper levels of the mine (S.K. Morris, Placer Dome North America Ltd. - Campbell Mine, written communication, 2000).

During the year, the Campbell mine produced 262 015 ounces of gold from 560 155 tonnes of ore milled, with an averaged head grade of 15.1 g/t. The daily milling rate was 1691 tonnes, with an average gold recovery of 96.2%. Diamond drilling included 76 070 m of exploration and definition drilling. Mining operations included 3716 m of new drifts and ramps and 1193 m of new raises (S.K. Morris, Placer Dome North America Ltd. - Campbell Mine, written communication, 2000). The company is focusing their immediate exploration efforts on definition of the ore at depth, close to the Reid Shaft, and continued expansion of the known ore structures developed from the internal ramp, from levels 27 to 30. The company is using stratigraphic and geological work, along with reconnaissance diamond drilling, to provide guidance for long-range exploration.

Table 1. Mine production and reserves in the Red Lake District in 1999.

Mine	Production to end of 1998		Production in 1999		Reserves at end of 1999	
	Tonnage @ Grade	Total Commodity	Tonnage @ Grade	Total Commodity	Tonnage	Grade
Placer Dome North America Campbell Mine	600 428 tons @ 0.529 ounce Au per ton	304 161 ounces	560 155 tonnes @ 15.1 g/t	262 015 ounces	2 123 000 tonnes (1)	14.6 g/t (5)
Goldcorp Inc. Red Lake Mine	none	none	None	none	1 700 000 tons (2)	1.37 ounce Au per ton
Madsen Gold Corp. Madsen Mine	90 103 tons @ 0.11 ounce Au per ton (4)	8930 ounces	149 416 tons @ 0.14 ounce Au per ton	18 499 ounces	269 318 tons (3)	0.25 ounce Au per ton

(1) Proven and probable reserves at December 31, 1998

(2) News release, Goldcorp Inc. January 13, 2000.

(3) Estimated proven and probable reserves to February 1999 and does not include 732, 830 tons of indicated resources @ 0.34 ounces per ton.

(4) Does not include historic 1938 to 1976 production

(5) Grade from Canadian Mining Journal December 1999 page 8.

Goldcorp Inc. – Red Lake Mine

The unionized employees (United Steelworkers of America local 950) of the Goldcorp Inc. – Red Lake Mine have remained on strike for more than three and a half years. Although talks had resumed on December 15, they continued for less than two days, adjourning until January 2000 (*The Chronicle Journal*, December 15-16, 1999). Although no ore was mined or milled last year, Dynatec Corporation was awarded a \$13 million contract at the beginning of 1999 (news release, Dynatec Corporation, May 13, 1999), to undertake an extensive underground exploration program.

Despite the on-going labour disputes, Goldcorp has continued its geology, geophysics, geochemistry and diamond drilling programs on its properties in the Red lake Greenstone Belt. By year end, the High Grade Zone gold reserves at the Red Lake Mine were increased by 329 000 ounces (press release, Goldcorp Inc., January 13, 2000).

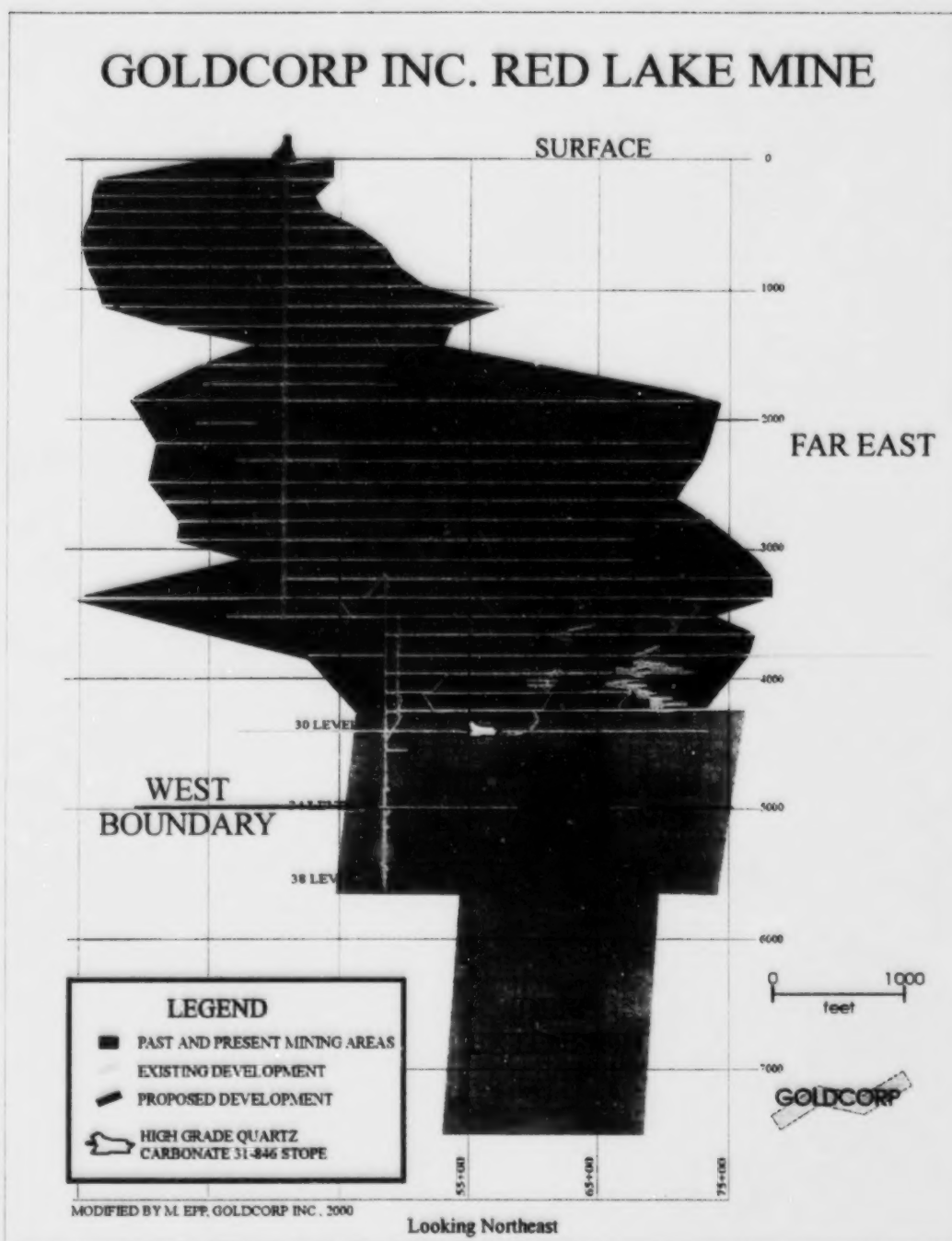


Figure 1. Longitudinal section Goldcorp Inc. Red Lake Mine.

The four areas subject to most of the work being performed at the Red Lake Mine are referred to as the High Grade Zone, the Deep Extension zone, the Far East zone and the West Boundary zone (press release, Goldcorp Inc., December 17, 1998; Figure 1). The High Grade Zone is located below previously mined areas. The 34 level is thought to be the center of this zone, 5000 feet below surface. According to the

company (press release, Goldcorp Inc., January 6, 2000), "This zone has parallel structures 200' to 1000' away from the extension of the trend and well within reach of existing mine infrastructures". The Far East zone refers to an area east of all the mining previously done and contains both quartz-carbonate vein type mineralization and the sulphide-silica replacement type mineralization. The Deep Extension zone is the area directly below the High Grade Zone. Exploration of this area is believed by the company to have opened areas of new potential for high-grade ore. The last area, known as the West Boundary zone, is located west and north of the previous mine workings (press release, Goldcorp Inc., February 26, 1999).

At the end of 1999, results from surface, delineation and exploration drilling programs on these four zones increased the total ore reserve at the mine by 17% i.e. to 2.32 million ounces of gold in 1.70 million tons of ore, with an average grade of 1.37 opt. (press release, Goldcorp Inc., January 13, 2000).

Assays from the High Grade Zone continued to exhibit significant results. Grades of 86.7 g/t over 6.7 m and 250.3 g/t over 4.3 meters were reported (*The Northern Miner*, December 20-26, 1999, p.1). In December, sections with assays as high as 17.46 ounces gold per ton over 16.4 feet and 8.35 ounces gold per ton over 15.1ft were being reported (press release, Goldcorp Inc., January 13, 2000).

Drilling in the upper levels of the mine outlined two narrow quartz-carbonate-bearing structures in the hanging wall of the main sulphide zone that contain visible gold. Combined with results from previous drilling, this appears to indicate the presence of two parallel structures, with a vertical length of 1200 feet, 1000 feet above the High Grade Zone and apparently in the same geological setting (press release, Goldcorp Inc., March 30, 1999). In this zone, reserves are estimated to be 570 000 ounces of gold, with an average grade of 0.36 ounces gold per ton, representing a 14% increase compared to last year-end (1998). Goldcorp plans to give this area special attention next year by means of an aggressive exploration program (press release, Goldcorp Inc., January 13, 2000).

A modest surface diamond-drill program at the Red Lake Mine began in November. It consisted of two holes totalling 1400 feet to examine extensions of the North and South Shaft zones, and three holes totalling approximately 5600 feet to examine the potential of various zones in the Far East and South (M. Epp, Goldcorp Inc., written communication, 2000).

Claude Resources Inc./Madsen Gold Corp. – Madsen Mine

Madsen Gold Corp. was taken over by Claude Resources Inc. of Saskatoon, in April of 1998 (Blackburn et al. 1998). The original Madsen Mine produced 2.4 million ounces of gold, from 1938 until its 1976 closure. Upon acquiring the Madsen Mine, the company continued mining and milling the ore from the Austin zone (news release, Claude Resources Inc., January 8 2000). During the year, 18 499 ounces of gold were produced from 149 416 tons, with an average grade of 0.14 ounces. As estimated to February 28 1999, the Madsen Mine has 269 318 tons of proven and probable reserves grading 0.25 ounces per ton, for 67 157 contained ounces (P. E. Olson, Claude Resources Inc., written communication, 2000). With indicated resources of 732 830 tons grading 0.34 ounces per ton gold and inferred resources of 399 000 tons grading 0.22 ounces per ton gold (P. E. Olson, Claude Resources Inc., written communication, 2000).

Claude Resources, while still in the pre-production phase, directed exploration and development activities towards mineralized segments of the McVeigh "tuff", located 75 to 125 m in the footwall of the Austin zone (news release, Claude Resources Inc., January 7 1999). Accessing the McVeigh zone through a combination of shaft access and a portal driven in 1998, "contract crews accessed up to 2000 feet of McVeigh stratigraphy, identifying four stoping blocks, approximately 300 feet vertical, above the second level" (P. E. Olson, Claude Resources Inc., written communication, 2000).

Claude Resources Inc. announced a \$10 million diamond-drill program at its Madsen property in September 1999. From the three drill programs conducted during 1999, the company announced significant results from their main targets. Surface drilling from a previously untested area east of the Madsen shaft returned grades of 9.6 g/t Au over 4.4 m, 7.2 g/t Au over 2.4 m and 14.7 g/t Au over 1.1 m. The West McVeigh zone also returned values of up to 33.9 g/t over 0.61 m extending the ore 30 m to the

west (news release, Claude Resources Inc., May 27 1999). The results from the McVeigh zone included 12.54 g/t Au over 1.3 m with two sections above 33 g/t over intervals up to 1.5 m (news release, Claude Resources Inc., September 15 1999). Both the McVeigh and Austin "tuffs" appear to contain several stacked lenses exhibiting identical alteration patterns and sulphide mineralogy, defined as an alteration corridor (P. E. Olson, Claude Resources Inc., written communication, 2000).

By the end of October, milling and mining operations at the Madsen Mine ceased due to low gold prices and insufficient minable reserves in the upper levels (news release, Claude Resources Inc., November 10 1999). Claude Resources Inc. has raised the necessary funding to de-water the mine below the 16th Level. In anticipation of a 53 000 foot drill program, an exploration drive and drill drift targeting the No. 8 zone will be cut as the platform from the 16th Level (P. E. Olson, Claude Resources Inc., written communication, 2000). In mid-1999, Claude Resources Inc. fenced off the perimeter of the Buffalo property and the portal was closed. The company also filled and leveled off the test pit, dug in 1998 at the DeVillier zone (H. Margolis, Claude Resources Inc., personal communication, 2000).

Table 2. Assessment files received in the Red Lake District in 1999.

Abbreviations					
AEM	Airborne electromagnetic survey	Lc	Linecutting		
AM	Airborne magnetic survey	Met	Metallurgical testing		
ARA	Airborne radiometric survey	OD	Overburden drilling		
Beep	Beep Mat survey	ODH	Overburden drill hole(s)		
Bulk	Bulk sampling	OMIP	Ontario Mineral Incentive Program		
DD	Diamond drilling	OPAP	Ontario Prospectors Assistance Program		
DDH	Diamond drill hole(s)	PEM	Pulse electromagnetic survey		
DGP	Down-hole geophysics	PGM	Platinum group metals		
GC	Geochemical survey	Pr	Prospecting		
GEM	Ground electromagnetic survey	RES	Resistivity survey		
GL	Geological Survey	Samp	Sampling (other than bulk)		
GM	Ground magnetic survey	Seismic	Seismic survey		
GRA	Ground radiometric survey	SP	Self-potential survey		
Grav	Gravity survey	Str	Stripping		
HLEM	Horizontal loop electromagnetic survey	Tr	Trenching		
HM	Heavy mineral sampling	UG	Underground exploration/development		
IM	Industrial mineral testing and marketing	VLEM	Vertical loop electromagnetic survey		
IP	Induced polarization survey	VLFEM	Very low frequency electromagnetic survey		

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Baird Township	Ansil Resources Ltd.	1999	DDH(2)=184M		2.19399 (34-99)
Baird Township	Madsen Gold Corp.	1992-1993	Preliminary Draft of Feasibility Study	Non-Assessment	
Baird Township	Meunier, D. J.	1999	Lc		2.19612 (57-99)
Baird Township	Placer Dome (CLA) Ltd. (Dom Creek Project)	1998	GM, IP		2.19390 (37-99)

RED LAKE DISTRICT—1999

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Baird Township	Placer Dome (CLA) Ltd. (Humlin/Redruth Project)	1998	DDH(2)=220.67M		2.19009 (98-98)
Baird Township	Placer Dome (CLA) Ltd. (Humlin/Redruth Project)	1998	DDH(6)=909.68M, Assays		2.19426 (42-99)
Ball Township	Maciejewski, A.J.	1999	Pr, Assays		2.19665 (71-99)
Balmer Township	Dickenson Mines Ltd. (Arthur W. White Mine)	1993	Feasibility Study for Potential Expansion (Phase I and II)	Non-Assessment	
Balmer Township	Green, John A.	1998	Str		2.19400 (22-99)
Balmer Township	Rubicon Minerals Corporation (Headway Property)	1998	DDH(1)=367.59M, Assays		2.19382 (36-99)
Balmer Township	Rubicon Minerals Corporation (Peterson Property)	1998	DDH(2)=303M, Assays, Lithogeochem		2.19833 (89-99)
Balmer, Byshe, Ranger and Willans Townships	Canadian Golden Dragon Ltd. (Gullrock Lake Property)	1996	IP, Lc		2.18468 (50-98)
Bateman Township	Placer Dome (CLA) Ltd. (Beatrice Peninsula)	1999	GC, Assays		2.19514 (47-99)
Bateman Township	Rivard, O.	1998	DDH(1)=144' (Lengthing the Hole)		2.19226 (15-99)
Bateman Township	Tri-Lateral Investments Corporation	1998	DDH(1)=755'		2.19078 (114-98)
Belanger Township	Noranda Mining and Exploration Inc. (Copperlode Property)	1997-1998	BHPM, GC, DDH(9)=3745M		2.19433 (38-99)
Belanger and Bowerman Townships	Noranda Mining and Exploration Inc. (Garnet Lake Property)	1998	GL, GC		2.19339 (21-99)
Belanger, Bowerman, and Mitchell Townships	Noranda Mining and Exploration Inc. (Garnet Lake Property)	1998	GM, HLEM		2.19174 (13-99)
Blackbear Lake area and Bateman Township	Murgor Resources Inc. (East Bay Property)	1997-1998	IP		2.19079 (112-98)

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Bruce, Gerry and South of Otter lakes areas	Tri Origin Exploration Ltd. (Confederation Project)	1998	GL, Pr, GC, Borehole PEM		2.19170 (5-99 to 7-99)
Bruce, Gerry and South of Otter lakes areas	Tri Origin Exploration Ltd. (Confederation Project)	1998	AEM, AMAG		2.19413 (40-99)
Byshe and Heyson Townships, Faulkenham Lake Area	Noranda Mining and Exploration Inc. (Bug River Project)	1998	HLEM, GM, Gravity-Elevation		2.19401 (33-99)
Casummit and Satterly lakes area	Colby Resources Corporation (Horseshoe Island Property)	1998	IP, Lc, clean out old trenches		2.18822 (83-98)
Casummit and Satterly lakes area	Gold Canyon Resources Inc. (Group 1 and 2 Properties)	1999	GL, Samp, Assays		2.19536 (55-99)
Casummit and Satterly lakes area	Gold Canyon Resources Inc. (Springpole Lake Property)	1998	GC (Lake Bottom Sediment)		2.19781 (90-99)
Coli Lake Area	Planet Exploration Inc. (Sidace Lake Project)	1998	DDH(6)=828M, Assays, GC		2.19165 (12-99)
Coli Lake Area	Planet Exploration Inc. (Sidace Lake Project)	1999	DDH(5)=1443M, Assays		2.19388 (35-99)
Dent and Mitchell Townships	Confederation Minerals Ltd. (Mitchell Properties)	1998	Pr, Samp, Assays		2.19113 (113-98)
Dixie Lake and South of Byshe and Willans Townships	Canadian Golden Dragon Resources Ltd. (Dixie Lake Property)	1997	IP, Lc		2.19076 (104-98)
Dome Township	Placer Dome (CLA) Ltd. (McKenzie Island Property)	1999	Soil Geochem, Assays		2.19629 (62-99)
Dome Township	Rubicon Minerals Corporation (Red Lake Property)	1997	Drill Core Samp, Whole Rock Geochem, Thin Sections		2.19403 (25-99)
Dome Township	Rubicon Minerals	1998	DDH(1)=384M,		2.18973

RED LAKE DISTRICT—1999

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
	Corporation (Dorion-McCuaig Property)		Lithogeochem		(96-98)
Dome Township	Rubicon Minerals Corporation (McCuaig Property)	1998	DDH(3)=384M, lithogeochem		2.19650 (66-99)
Dome Township	Rubicon Minerals Corporation (Red Lake Property)	1997-1998	Soil Geochem, Pr, Samp, GL, Lithostructural Analysis		2.19402 (24-99)
Dome Township	Rubicon Minerals Corporation (Red Lake Project)	1998	DDH(8)=1133.4M, Lithogeochem		2.19250 (11-99)
Dome Township	Rubicon Minerals Corporation (Red Lake Project)	1998	DDH(1)=297M, Assays, Whole Rock Geochem		2.19130 (1-99)
Dome, Fairlie, Heyson Townships	Meunier, David	1998	Str, Tr, Recutting claim lines		2.19075 (103-98)
Faulkenham Lake Area and Heyson Township	Noranda Mining and Exploration Inc. (Bug River Project)	1998	GL, Samp, GC, DDH(8)=2330M, BHPM		2.19574 (56-99)
Fredart and Gerry lakes Area	Noranda Mining and Exploration Inc. (Ben Lake-Sandy Pines Grid Extension)	1998	GM, HLEM, GL, Lithogeochem		2.19132 (4-99)
Gerry Lake Area	Confederation Minerals Ltd. (10 Mile Creek Property)	1998	HLEM		2.19118 (108-98)
Gerry Lake Area	Confederation Minerals Ltd. (10 Mile Creek Property)	1998	Pr		2.19117 (109-98)
Gerry Lake Area	Noranda Mining and Exploration Inc. (Ben Lake Project)	1998	DDH(4)=1659M, BHPM, Lithogeochem		2.19841 (96-99; 97-99)
Karas Lake Area	Noranda Mining and Exploration Inc. (Snake Falls Project)	1997	DDH(5)=2169.7M, BHPM, Lithogeochem		2.19102 (2-99; 3-99)
Lingman Lake Area	Echo Bay Ontario Ltd. (Lingman Lake Property)	1998	Tr, Str, Samp, Assays		2.18851 (92-98)
Medicine Stone Lake, Killala and Mulcahy Twps.	Triex Resources Ltd. (Medicine Stone)	1998	GL, Samp, Pr, Assays		2.18966 (99-98)

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
	Property)				
South of Otter Lake Area	Noranda Mining and Exploration Inc. (Dixie 18 Property)	1998	DDH(2)=931M, Assays, Lithogechem,		2.19798 (92-99)
Mitchell Township	Noranda Mining and Exploration Inc. (Meyer-Horseshoe Lake Option)	1998	BHPM, Assays, Lithogechem, DDH(1)=794.9M		2.19133 (9-99; 10-99)
Mitchell Township, Uchi Lake & Earngey Township	Noranda Mining and Exploration Inc. (South Bay Property)	1998-1999	Lc, GM, HLEM, GC, DDH(1)=243M		2.19737 (77-99; 78-99)

*Corresponds to Resident Geologist Office file designation

EXPLORATION ACTIVITY

A complete summary of exploration activity is given in Table 3. Low metal prices and a drastic global reduction in investment in the junior mining and exploration sector has caused a similar reduction in the number of companies active in the district and the size of their exploration programs. Three major mining companies, **Noranda Mining and Exploration Inc.**, **Placer Dome North America Inc.** and **Goldcorp Inc.** continued long-standing exploration programs on a number of properties in the Red Lake and Birch-Confederation-Uchi lakes belts. **Claude Resources Inc.** and its subsidiary company **Madsen Gold Corp.** continued exploration on its Madsen Property holdings, around the Madsen Mine.

Programs with significant exploration expenditures and/or significant known results, and properties whose location is of particular strategic or geologic interest are described below. Exploration information included in this section is taken from the assessment files in the Red Lake Resident Geologist's office, unless otherwise indicated. Programs are keyed with numbers in parentheses to Table 3 and Figures 2, 3, 4 and 5.

Red Lake Greenstone Belt

Ansil Resources Ltd. has two properties in the Red Lake belt, the Ansil West Red Lake property (1) in Todd Township and the Ansil property (2) in Baird Township. Ansil Resources completed a 100 m diamond-drill hole on claim KRL1210035 in Todd Township, late in September. The Ansil West Red Lake property adjoins the Mount Jamie #2 property to the north. The hole encountered mafic and felsic metavolcanic rocks with estimated pyrite and pyrrhotite content of 4 to 5%. A granodiorite body was encountered near the end of the hole, suggesting a shallowly dipping volcanic body. No assay results were available at the time of writing.

A two-hole diamond-drill program, totalling 184 m, was completed in April on claim number KRL1184326, in Baird township. The Ansil property is part of a block of 20 claim units located along the southern boundary of Baird Township. A bush road from the Starrat-Olsen town-site leads to the New Falkenham Mine and continues to the west and south of the claim group. Designed to test an area between the New Falkenham shaft and a mineralized shear zone, the holes cut granodiorite and sheared granodiorite with minor mafic, felsic and feldspar porphyry dikes. Significant quartz and pyrite hosted within a mafic volcanic matrix are present within this shear zone.

Goldcorp Inc. continued exploration at the Cochenour property and surrounding area in Dome Township (9). The project is in the second year of a US\$5 million, two-year program (press release, Goldcorp Inc., February 17, 1999). This property hosts the past-producing Cochenour-Willans Mine which produced a total of 1.25 million ounces of gold from ore averaging 0.54 oz gold per ton.

During 1999, Goldcorp conducted a nine-hole diamond-drill program totalling 8228 ft in the Cochenour area. By drilling between the McMarmac and Cochenour Mines, the company tested potential depth extensions of the gold-mineralized structure (press release, Goldcorp Inc., March 30, 1999). Goldcorp also continued surface exploration with stripping, channel sampling and surface mapping (M. Dehn, Goldcorp Inc., written communication, 2000).

Goldcorp also undertook mobile metal ion and enzyme leach tests to the east of the Cochenour Mine, in order to determine the usefulness of these techniques and how roaster contamination from previous mining activity might affect them. A total of 4 300 line km of a combined airborne magnetic, electromagnetic and radiometric geophysical survey was flown over a two block section in the eastern Red Lake area, covering a large area of the Red Lake greenstone belt. Interpretation of total field and vertical gradient magnetic data defined structural breaks and regional trends, allowing a better understanding of the geological and structural setting (M. Dehn, Goldcorp Inc., written communication, 2000). The company plans to continue with detailed surface work and diamond drilling in 2000.

The **Goldcorp Inc.** Trout Bay base metal property is situated 25 km west of Red Lake and 1.5km south of Trout Bay, in Ball and Mulcahy townships. It can be accessed by boat. Goldcorp acquired the property as part of the Willanour Resources land package when they bought that company in 1998 (news release, Goldcorp Inc., February 18, 1999). Goldcorp also expanded their land holding in the area by staking all available ground with similar, perceived mineral potential in the Trout Bay area. Road rehabilitation and construction, geological, geophysical and diamond-drill hole compilation of the property, as well as a soil geochemistry program are planned for the 2000 field season (M. Dehn, Goldcorp Inc., written communication, 2000).

ITL Capital Corporation/Cypress Minerals Corp./Rupert Resources Ltd. continued their deep diamond-drilling project on their Durham-McEwen property in Balmer Township (12). The claim block is located immediately east of the Goldcorp Inc. Red Lake Mine. In 1996, one hole was diamond drilled to test for a possible depth extension of the Red Lake Mine ore zones. A second hole, 98-01, was collared 3000 ft south of the first hole on September 3, 1998. It reached a vertical depth of 5000 ft before mechanical problems slowed down the drilling. The hole was terminated at 5940 ft on April 6, 1999 (Canada Stockwatch, April 7, 1999).

Placer Dome North America Ltd. conducted two soil geochemistry projects in the Red Lake District. One was conducted on their McKenzie Island property (20) in Dome Township and the other on their Beatrice Peninsula property (19) in Bateman Township.

The McKenzie Island property, located on the west side of McKenzie Island, consists of one unpatented mining claim (KLR1184170) which is composed of two, 16 ha claim units. An existing grid was partially rehabilitated and utilized for the survey. A total of 52 soil samples were collected at 25 m stations along previously cut lines spaced 100 m apart; the survey totaled 1300 line m. Samples were collected from the B-horizon and sent to Enviro-Test Labs in Winnipeg for Fire Assay (FA) and to XRAL Lab in Mississauga, Ontario for Inductively Coupled Plasma Optical Emission Spectrometry (ICP70). The survey outlined three gold anomalies oriented grid east (i.e. with a baseline at 65°). These anomalous values appear to correlate along strike with the known gold mineralization found in trenches located on the eastern portion of the claim block.

The Beatrice Peninsula property is located around the Beatrice Peninsula in the central portion of East Bay. The subject work was done on claim KRL1209205 (two, 16 ha units) which is one of seven mining claims consisting of fourteen 16 ha claim units staked for Placer Dome in 1994. This survey consisted of 77 soil samples collected at 50 ft intervals, along lines spaced 200 ft apart; the entire survey consisted of 5600 line ft. A previously cut grid was used to correlate the geochemistry of the area with a possible, deep

mafic/ultramafic contact defined by a ground magnetometer survey conducted in 1996 by Placer Dome. Three gold soil anomalies with a grid north direction were defined, which correlate with the results from the ground magnetometer survey.

Planet Exploration Inc. continued a second phase of diamond drilling on their Sidace Lake Project gold prospect (21) in the Coli Lake Area, which was optioned from Corsair Exploration Inc. The property is situated 20 km northeast of Balmertown and is accessible by road from Red Lake. The property consists of 30 contiguous claims totalling 448 units covering 7168 ha.

All five holes in the phase two program were drilled in proximity to the first phase hole RL 98-05. All intersected the same alteration and mineralization encountered in the phase one hole. The best intersection from this drilling assayed 12.79 g/t Au over 1.75 m (news release, Planet Exploration Inc., March 16, 1999). This inspired the company to implement a third phase program, consisting of 6 diamond-drill holes totalling 1195 m, designed to confirm the main zones of mineralization. Anomalous gold was detected in an intensely sheared, bleached and altered zone in high metamorphic grade mafic to ultramafic rocks. The gold intersections conform to a "virtually vertical pyrrhotite-pyrite-arsenopyrite rich, blue-grey, hard, cherty, alteration zone which is associated with quartz-tourmaline veining" (news release, Planet Exploration Inc., May 26, 1999). The company considers hole RL99-12, with two gold-bearing intersections, as the most significant diamond drilled to date. Results include 3.12 g/t Au over 11.58 m, including 1.07 m of 12.24 g/t Au, and 2.03 g/t Au over 6.56 m, including 0.20 m of 14.58 g/t Au (news release, Planet Exploration Inc., May 27, 1999).

Rubicon Minerals Corporation extended its land holding in Red Lake by staking 391 claim units over the northeast extension of the Red Lake greenstone belt adjacent to the Planet Exploration Inc. property. In addition, they optioned 252 claim units known as the Adams Lake Property (24), in McDonough, Bateman and Balmer townships (press release, Rubicon Minerals Corporation, February 24, 1999) from prospector P. English. In turn, Rubicon optioned 166 claims located approximately 6 km east of the Campbell and Red Lake mines to **Royal Roads Corporation** (press release, Rubicon Minerals Corporation, May 5, 1999). Throughout the summer, Royal Roads completed phase one of a three-year program consisting of data compilation, prospecting and preliminary lithogeochemical sampling. This work confirmed previously reported gold values and anomalous arsenic in the host metavolcanic rocks (press release, Rubicon Minerals Corporation, October 24, 1999). Concurrently, an integrated program of line cutting, magnetic and very low frequency electromagnetic (VLF-EM) geophysical surveys and geological mapping was conducted. This work was designed to evaluate structures conformable and semi-conformable to host gold deposits in the district (*The District News*, November 3, 1999, p.2). Rubicon continues to work with Royal Roads and plans to help implement phase two of the option agreement in 2000.

The Rubicon Minerals Corporation McCuaig property gold project (25) is located in Dome Township. It starts at the eastern end of the Dorion McCuaig Corridor and is adjacent to the past-producing McKenzie Red Lake Mine. Rubicon is earning a 50% interest in this three claim (10 unit) property, which is located approximately 1.5-km northwest of Goldcorp's Cochenour property, from Golden Tag Resources Ltd. (press release, Rubicon Minerals Corporation, October 22, 1999). Work at the McCuaig gold project was completed by the end of the year. The surface exploration program consisted of stripping and sampling of the contact zone of an extensively altered and deformed ultramafic body (press release, Rubicon Minerals Corporation, October 22, 1999). Rubicon believes that the gold mineralization in the Red Lake camp is associated with a marker horizon or "break", within which ultramafic bodies are situated (press release, Rubicon Minerals Corporation, October 22, 1999). The company has identified this as a high potential zone believing that it possesses a similar geological setting to that of the major mines in the District (*The District News*, October 27, 1999, p.5).

Birch-Confederation-Uchi Greenstone Belt

Gold Canyon Resources Inc. conducted a twelve-hole diamond-drill program totalling 2779 m (9117 ft) at five, widely separated targets on Springpole Lake (8). Eight of the twelve holes encountered intervals of moderately- to strongly-altered rock, and four holes encountered intervals of weakly- to moderately-altered rock. Anomalous gold mineralization was encountered in seven of the twelve holes, with gold values over 1.5 m widths ranging up to 8.07 g/t Au (0.24 ounce per ton gold). One hole averaged 309 ppb Au over 1037 feet, another averaged 186 ppb Au over 1047 feet and a third hole terminated in 60 feet of rock averaging 538 ppb.

Noranda Mining and Exploration Inc. continued their long-standing base metal exploration work in the the South Bay-Snake Falls portion of the greenstone belt, south and west of the past-producing South Bay Mine. In February of 1999 they carried out a one-hole, 243 m diamond-drill program on their South Bay property (16). The hole intersected stringer sulphide mineralization at 214.4 m (i.e. 0.03% Cu and 0.82% Zn over 0.35 m) and at 217.9 m (i.e. 0.006% Cu and 0.11% Zn over 3.7 m). Major element geochemistry conducted on samples collected from this hole did not reveal any significant alteration trends and suggest a lack of hydrothermal alteration. Noranda retains several other properties in good standing in the South Bay-Snake Falls portion of the greenstone belt.

Nuinsco Resources Inc. conducted a three-hole, 1007.7 m diamond-drill program on their Confederation Lake base metal property (17), adjacent to the past-producing South Bay Mine. These holes were drilled to investigate two deep Crone Pulse EM anomalies from a 1998 survey carried out by Confederation Minerals. All holes intersected intense hydrothermal alteration and highly anomalous copper and zinc stringer sulphide mineralization. Two holes in the north drill target intersected 4 stacked alteration zones up to 35m thick (in core) containing widespread disseminated and stringer-like sulphide mineralization. Assay results include 5595ppm Zn over 2.4m and 8293ppm Zn over 1.5m in one zone and 2782ppm Zn, 2098ppm Pb and 28.8ppm Ag over 2.1m. The southern drill target was proved to be a 10.6m (in core) unit of cherty tuff containing 5-8% sulphides (P. Pitman, Nuinsco Resources Ltd., written communication). These results are, according to the company, sufficiently encouraging to warrant further exploration work.

Northern Greenstone Belts

Houston Lake Mining Inc. holds two rare-metal pegmatite properties along the Bearhead Fault, a 140 km long, northwest-striking feature which separates the Berens River and Sachigo Subprovinces. The Pakeagama Lake property (10) is 160 km north of Red Lake, while the Favourable Lake property is 60 km farther to the northwest of Pakeagama Lake, along the fault zone. The Pakeagama Lake property has been subject to extensive work by F.W. Breaks of the Ontario Geological Survey (Breaks, Tindle and Smith 1999). The property is underlain by foliated, coarse-grained to pegmatitic, peraluminous muscovite-biotite granite of the Pakeagama Lake pluton, which intrudes the metavolcanic and metasedimentary rocks of the North Spirit Lake greenstone belt. The Pakeagama Lake rare-metal pegmatite is situated within the northwestern end of the Pakeagama Lake pluton. The Pakeagama Lake pegmatite is a complex-type, petalite-subtype pegmatite with well-developed internal zones. Channel samples by the Ontario Geological Survey returned Li_2O values between 4.33 and 4.79%. Twenty-four samples were submitted for analysis to Chemex Labs of Mississauga, Ontario, by Houston Lake. The twenty-four samples returned an average value of 280 g/t Ta_2O_5 , 0.46 % Rb_2O , 817 g/t Cs_2O , 366 g/t BeO , 124 g/t Sn, 116.0 g/t Nb_2O_5 , 1.42 % Li_2O , 4.3 g/t Tl, 4.5 g/t Ge, and 6.9 g/t Sb. (company press release Jan 18, 2000). The Favourable Lake property (11) has been staked, but prospecting and exploration will be carried out during 2000 (E. Grayme Anthony, Houston Lake Mining Inc. personal communication).

Wolfden Resources Inc. carried out prospecting and sampling on their Little Stull Lake property on the Ontario-Manitoba boundary (32).

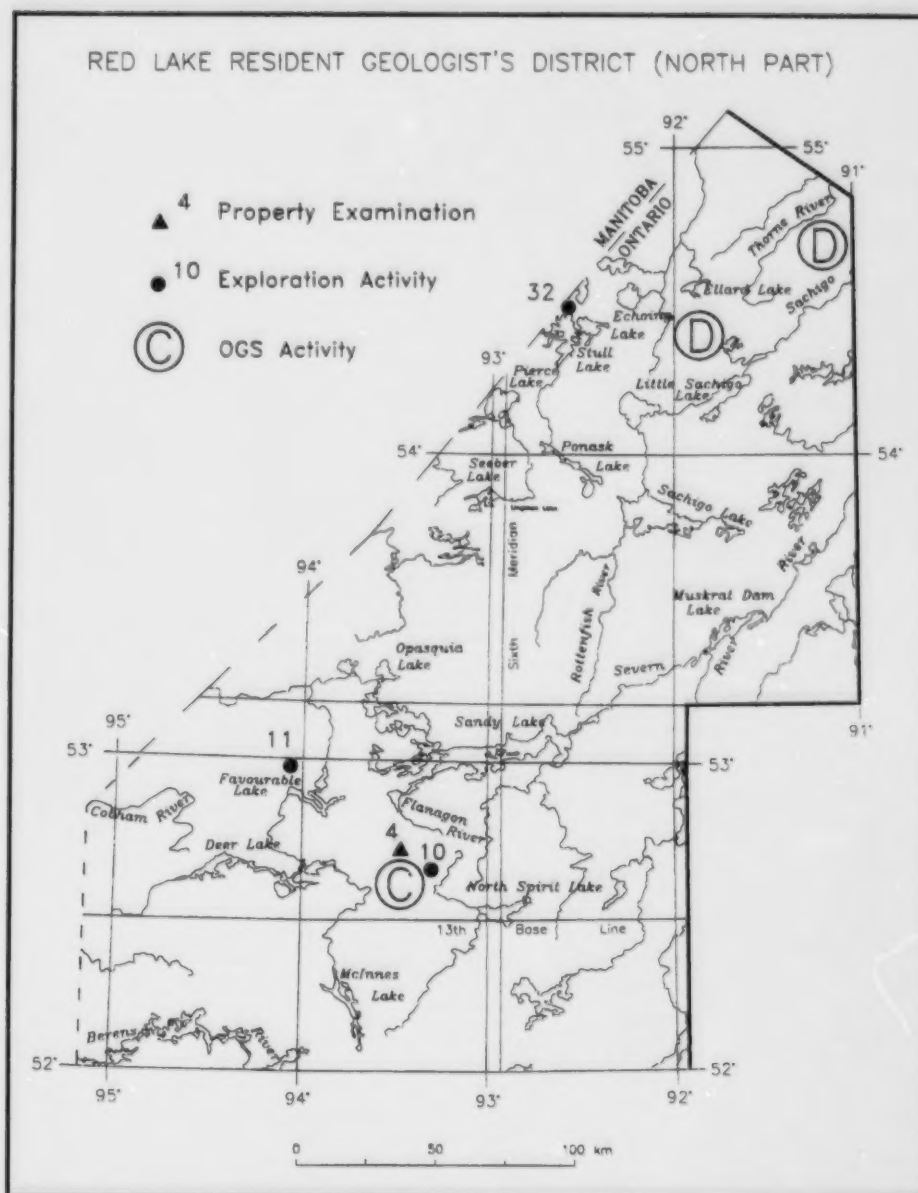


Figure 2. Red Lake District (north part): exploration, property visits and OGS activity.

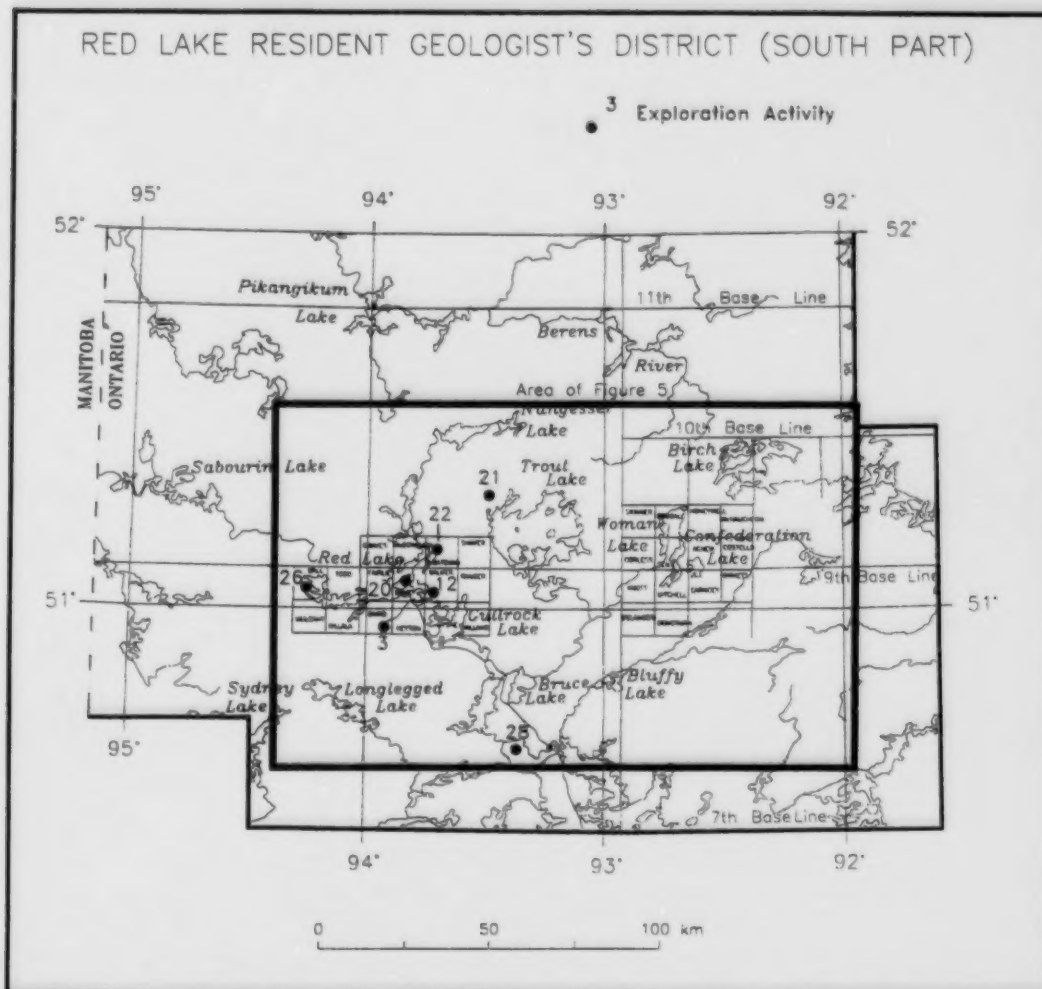


Figure 3. Red Lake District (south part): location map and exploration activity.

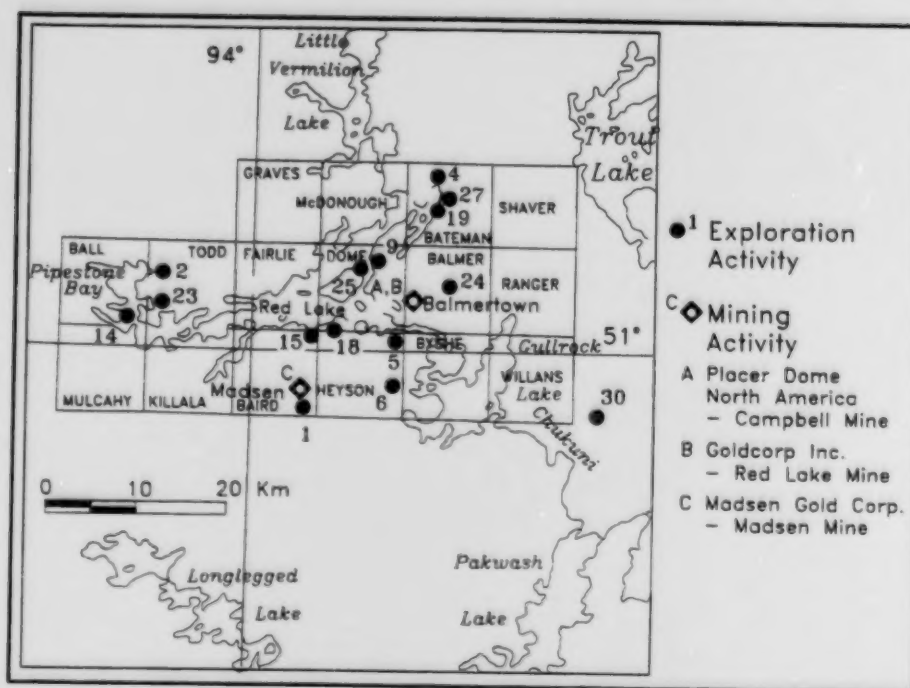


Figure 4. Red Lake greenstone belt: mining and exploration activity.

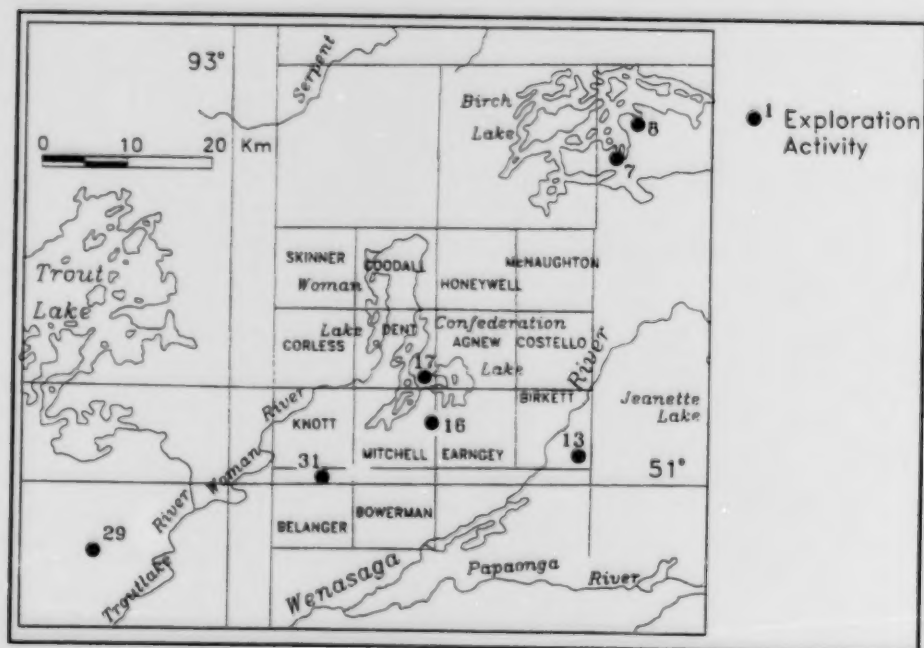


Figure 5. Birch-Confederation-Uchi greenstone belt: exploration activity.

Table 3. Exploration activity in the Red Lake Resident Geologist District in 1999.

Abbreviations			
AEM	Airborne electromagnetic survey	Lc	Linecutting
AM	Airborne magnetic survey	Met	Metallurgical testing
ARA	Airborne radiometric survey	OD	Overburden drilling
Beep	Beep Mat survey	ODH	Overburden drill hole(s)
Bulk	Bulk sampling	OMIP	Ontario Mineral Incentive Program
DD	Diamond drilling	OPAP	Ontario Prospectors Assistance Program
DDH	Diamond drill hole(s)	PEM	Pulse electromagnetic survey
DGP	Down-hole geophysics	PGM	Platinum group metals
GC	Geochemical survey	Pr	Prospecting
GEM	Ground electromagnetic survey	RES	Resistivity survey
GL	Geological Survey	Samp	Sampling (other than bulk)
GM	Ground magnetic survey	Seismic	Seismic survey
GRA	Ground radiometric survey	SP	Self-potential survey
Grav	Gravity survey	Str	Stripping
HLEM	Horizontal loop electromagnetic survey	Tr	Trenching
HM	Heavy mineral sampling	UG	Underground exploration/development
IM	Industrial mineral testing and marketing	VLEM	Vertical loop electromagnetic survey
IP	Induced polarization survey	VLFEM	Very low frequency electromagnetic survey

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
1	Ansil Resources Ltd. (Ansil Property)	Baird Township (Au)	DDH(2)=184m (2.19399)
2	Ansil Resources Ltd. (Ansil West Red Lake Property)	Hammell Lake (Todd Township) Area (Au)	DDH(1)=200m (2.19693)
3	Claude Resources Inc. (Madsen Property)	Baird Township (Au)	DD, GL, Bulk
4	Consolidated Westview Resource Corp. /Wolfden Resources Inc. (East Bay Property)	Bateman Township and Blackbear Lake Area (Au)	DDH(4)=900m, Samp
5	English, P. (Heyson Township Property)	Heyson Township (Au) (OPAP)	Lc, Pr, Str, Geophysics, Beep, Samp
6	Gangloff, R. (Sully Lake Property)	Heyson Township (Au) (OPAP)	Pr, Lc, GM, Samp
7	Gold Canyon Resources Inc. (Group 1 and 2 Properties)	Casummit Lake and Satterly Lake areas (Au)	GL, Samp, Assays (2.19536), Pr
8	Gold Canyon Resources Inc./Paco Rico Resources (Springpole Lake Property)	Casummit Lake Area (Au)	DDH(12)=2779m, Samp, Assays
9	Goldcorp Inc. (Cochenour Willans Property)	Dome Township (Au)	DD, Str, GL
10	Houston Lake Mining Inc. (Pakeagama Lake Project)	Pakeagama Lake Area (Rare Metals)	Pr, Samp, Assays
11	Houston Lake Mining Inc. (Favourable Lake Project)	Favourable Lake (North) Area (Rare Metals)	Staking
12	ITL Capital Corporation/Cypress	Balmer Township (Au)	DDH(1)=5940'

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
	Minerals Corp./Rupert Resources Ltd. (Durham-McEwen Property)		
13	Johnson, S.	Birkett Township	Pr
14	Maciejewski, A.J.	Ball Township (Au, Pd, Pt)	Pr, Assays (2.19665)
15	Meunier, David J.	Baird Township (Au)	Lc (2.19612)
16	Noranda Mining and Exploration Inc. (South Bay Property)	Mitchell and Earngey townships (BM)	DDH(1)=243m, GC (2.19737)
17	Nuinsco Resources Ltd. (Confederation Lake Property)	Mitchell and Dent townships (BM)	DDH(3)=1007.7m, Samp
18	Peterson, C. (Skookum Property)	Dome and Heyson townships (Au) (OPAP)	Str, Samp
19	Placer Dome (CLA) Ltd. (Beatrice Peninsula)	Bateman Township (Au; BM)	GC, Assays (2.19514)
20	Placer Dome (CLA) Ltd. (McKenzie Island Property)	Dome Township (Au)	GC, Assays (2.19629)
21	Planet Exploration Inc. (Sidace Lake Project)	Coli Lake Area (Au)	DDH(5)=1443m, Assays (2.19388) (Phase 2) DDH(6)=1195m (Phase 3)
22	Rivard, O. (Cross Island Property)	Bateman Township (Au)	DD
23	Rivard, O. (Heath Property)	Todd Township (Au)	Tr, Samp
24	Royal Roads Corporation/Rubicon Minerals Corporation (Adams Lake Property)	Balmer Township (Au)	Data Compilation, GC, Pr, GL, Samp, Lc, GM, VLFEM
25	Rubicon Minerals Corporation (McCuaig Property)	Dome Township (Au)	Str, Samp, Tr
26	Ruza, J.	Ball Township (Au)	Pr, Samp
27	Stechishen, A.M.	Bateman Township (Au) (OPAP)	Lc, Pr, GL Geophysics, GC, Str, Samp
28	Strilchuk, G.	Gould Lake Area	Pr, Samp
29	Tri Origin Exploration Ltd. (Confederation Property)	Gerry Lake and South of Otter Lake areas (BM)	AM, AEM
30	Twomey, T.	South of Otter Lake Area (BM) (OPAP)	Beep, Lc, Pr, GC
31	Williamson, J.M.	Belanger Township (BM) (OPAP)	Pr, Str, Samp
32	Wolfden Resources Inc. (Little Stull Lake Property)	Stull Lake Area (Au)	Pr, Samp

RESIDENT GEOLOGIST STAFF AND ACTIVITIES

The Red Lake Resident Geologist's Office was staffed until June 1 by C. E. Blackburn, Regional Resident Geologist, Red Lake – Kenora, C. Storey, Red Lake District Geologist and L. Kosloski, Red Lake District Support Geologist. C. E. Blackburn left June 1 to assume duties as Mineral Development Coordinator in

Kenora and C. Storey took over as Acting Regional Resident Geologist on June 14. Susie DM. Gosselin became Acting Red Lake District Geologist on August 11. L. Kosloski remained Red Lake District Support Geologist. Caleb Scott and Jagger Benham served as summer assistants funded by the "Experience '99" program.

Office staff provided information and assistance to industry, government and university personnel through geological consultations, assessment file research, 24 property visits (Table 4, Figures 5 and 6), visits to local mines, geological reconnaissance, technical talks, and field trips to District geology and mineral occurrences. The District was represented at the Annual International Convention and Trade Show, Prospectors and Developers Association of Canada, in Toronto in March; at the Northwest Ontario Mines and Minerals Symposium in Thunder Bay, in April; and at the Manitoba Mining and Minerals Convention in Winnipeg, in November. The Red Lake Resident Geologist's Office hosted the annual Resident Geologist program meeting and the "Meet and Greet" session where the local prospecting and exploration community had a chance to talk with MNDM senior management and Minister of Northern Development and Mines Tim Hudak. Other work included reviewing and correcting Mineral Deposit Inventory (MDI) files.

Drill Core Storage Site

There were 6 users of the Red Lake remote drill core storage site during 1999. No additional diamond-drill core was added to the collection during 1999. Drill core from the Howey and Hasaga Mine crown pillar stability drilling stored at the Resident Geologist's Office was moved to the site. Steel core racks obtained late in 1998 were erected on a concrete pad during June and July.

Land Use Planning

Office staff contributed to the *Lands for Life* and *Ontario's Living Legacy* initiatives by preparing mineral resource assessments in January and claim fabric analyses for 12 *Ontario's Living Legacy* sites in August and November. Staff also attended public information and client consultation sessions. Four land severance consents were handled and staff provided input on potential cottage lot developments in the Red Lake and Ear Falls areas.

PROPERTY EXAMINATIONS

Major authorship of the following property visits is indicated in parentheses following titles.

Table 4. Property visits conducted by the Red Lake Regional Resident Geologist and Staff in 1999

Number (keyed to Figures 2 and 6)	Property/Occurrence
1	Jubilee Lake, Birkett Township
2	Madsen Mine, Baird Township
3	Martene Road, Coli Lake Area
4	Pakeagama Lake Pegmatite, Pakeagama Lake Area
5	Root Lake 34 Claim Group, Root Lake Area
6	Griffith Mine, Bruce Lake Area
7	Bathurst Mine, Skinner Township
8	Madsen #1 Big Trench, Baird Township
9	Overnite Road Sulphide Zone, Campfire Lake Area

10	Laddie Red Lake Mine, Balmer Township
11	Consolidated Morrison Pegmatite, Root Lake Area
12	West Red Lake Mine, Ball Township
13	Scott Claim KRL 1712 Trench, Ball Township
14	Williamson Prospect, Belanger Township
15	Belanger Road Quartz Vein, Belanger Township
16	South Bay Mine, Dent Township
17	Cochenour Willans Mine, Dome Township
18	Windfall Road, Gould Lake Area
19	Goldcorp - Red Lake Mine, Balmer Township
20	Gangloff Property, Heyson Township
21	Skookum Property, Dome Township
22	Stechishen Property, Bateman Township
23	O'Brien Rivard, Bateman Township
24	Consolidated Westview Resources Ltd., Bateman Township

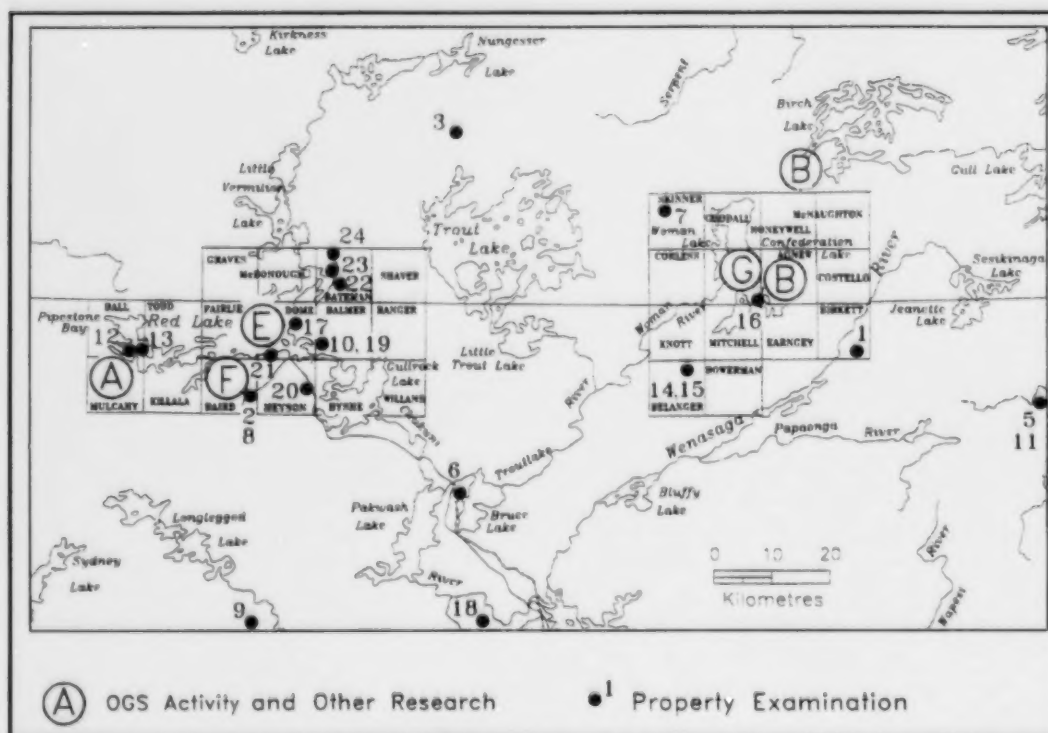


Figure 6. Property examinations, OGS and other research activity.

West Red Lake (C.C. Storey)

The West Red Lake property is located on the east shore of Phillips Channel of Red Lake, in southeastern Ball Township (Figure 7). The property is 25 km from the community of Red Lake and can be reached by boat. L. Howey discovered gold here in 1930. The National Gold Syndicate was subsequently formed to develop the property. The Syndicate excavated a 26 ft prospecting shaft at the water's edge, which was buried by later exploration work. West Red Lake Mines Inc. was incorporated in March 1934, and by July had excavated a 2-compartment shaft to 205 ft depth, with a level at 200 ft. The shaft was deepened to 217 ft and the south drift lengthened to 347 ft in 1935 (Horwood 1945). The property was held and explored by West Red Lake Gold Mines until 1958. This company's work consisted of underground sampling and surface trenching, sampling and diamond drilling. W. Hermiston diamond-drilled three holes on the property between 1977 and 1980. Shane Resources Ltd. currently holds the mineral rights, the surface rights being patented and held by another party. Shane Resources carried out prospecting, a humus geochemical survey, ground magnetometer and VLF-EM geophysical surveys and 1693 m of diamond drilling between 1986 and 1988. In 1995 and 1996, Hemlo Gold Mines Inc. optioned the property from Shane and carried out magnetometer and induced polarization (IP) surveys, geological mapping and sampling (Truscott 1996).

The West Red Lake property consists of three claim blocks of 25 staked, leased and patented claims totalling approximately 404 ha. The work described was conducted on an eight claim block, as shown on Figure 8. The area has been mapped by Riley (1975) as intercalated mafic and felsic metavolcanic rocks and minor, clastic metasedimentary rocks, which are now interpreted as belonging to the 2900 to 3000 Ma Ball Assemblage (Stott and Corfu 1991). More detailed property scale mapping by Truscott (1996) indicates several, small, quartz porphyry, intrusive plugs. The felsic metavolcanic rocks are mapped as dacite crystal tuff intercalated with basalt and basaltic komatiite flows. The rocks show varying amounts of carbonatization, silicification and sericitization. Iron carbonate and fine-grained, disseminated pyrite is common. The Middle Bay Deformation Zone (an intense high strain zone striking west-northwest across Middle Bay of Red Lake) has affected these rocks (Truscott 1996, Parker 1999a). The deformation and alteration zones shown on Figure 7 are after Durocher et al (1991).

Table 5. Assay results from the West Red Lake property.

Detection Limit Sample	Au ppb 5	Cu ppm 2	Pb ppm 0.1	Zn ppm 5	Ag ppm 1	As ppm 3.5
99CS061	5754	-	-	-	-	-
99CS062	4681	-	-	-	-	-
99CS063	25	8	30.92	55	3	N.D.
99CS064	9	-	-	-	-	-
99CS065	134	12.7	3.49	43	4	252.5
99CS066	5	-	-	-	-	-
99CS067	11	-	-	-	-	-
99CS068	1293	10.9	23.82	14	6	104.7
99CS069	531	-	-	-	-	-
99CS070	232	30.2	15.09	25	5	74.4

- not analyzed, N.D. not detected

99CS 061 and 062 are grab samples of vein Number 2

99CS 063 felsic host rock of vein Number 2

99CS 064 quartz vein (drill core)

99CS 065 iron carbonate-quartz vein (drill core)

99CS 066 carbonatized mafic rock (drill core)

99CS 067 quartz porphyry (from dump)

99CS 068 rusty pyrite rich altered rock (from dump)

99CS 069 felsic rock with fuchsite (from dump)

99CS 070 rusty, pyrite bearing felsic rock (from dump)

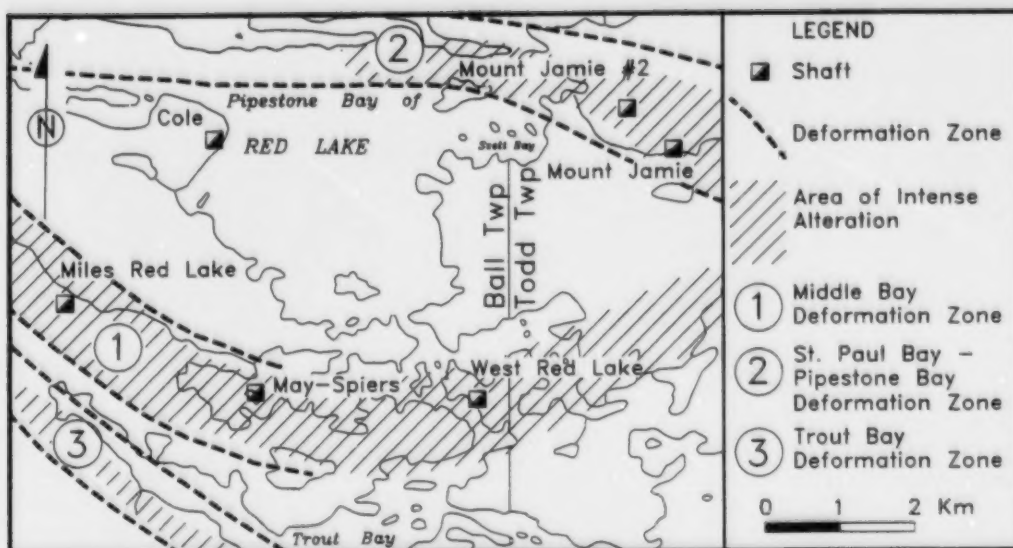


Figure 7. Gold prospects and deformation zones at the west end of Red Lake.

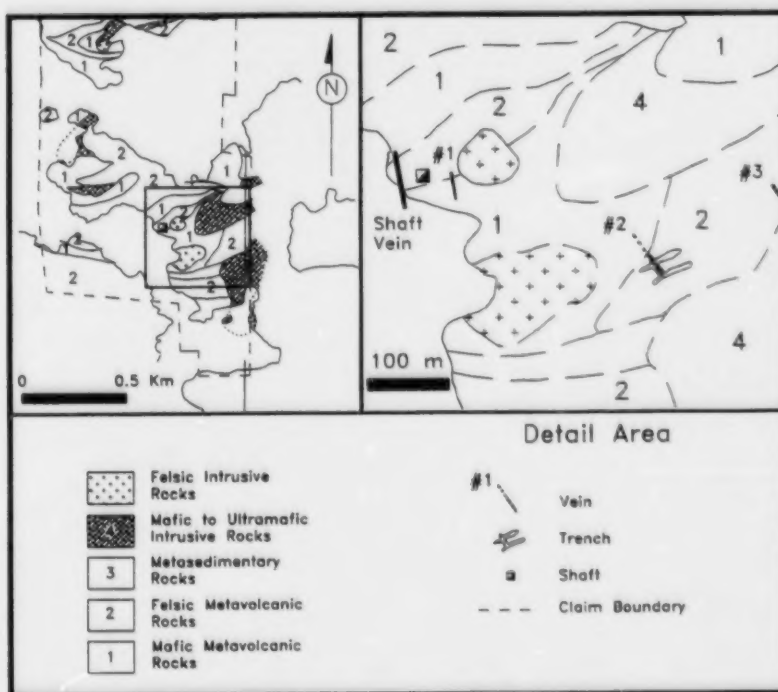


Figure 8. West Red Lake property.

The mineralization consists of several north-northwest-striking veins that dip steeply to the east, in north-northwest-striking fracture systems. Work by West Red Lake Gold Mines in the 1930's identified four veins named the Shaft Vein, Number 1, Number 2 and Number 3. These are exposed in several, old pits

and trenches that are now largely overgrown. The approximate locations of these veins are shown on Figure 8. Only the Shaft Vein was explored underground. The veins are composed of white quartz accompanied by pyrite, small amounts of chalcopyrite and sphalerite and minor tourmaline. Gold values are erratic, but in some places high.

Gangloff Property-Heyson Township (S.D.M. Gosselin)

The Gangloff Property is located in the eastern part of Heyson Township and is easily accessed via a short bush road off of the west side of Highway 105, 4.5 km southeast of Red Lake (Figure 9).

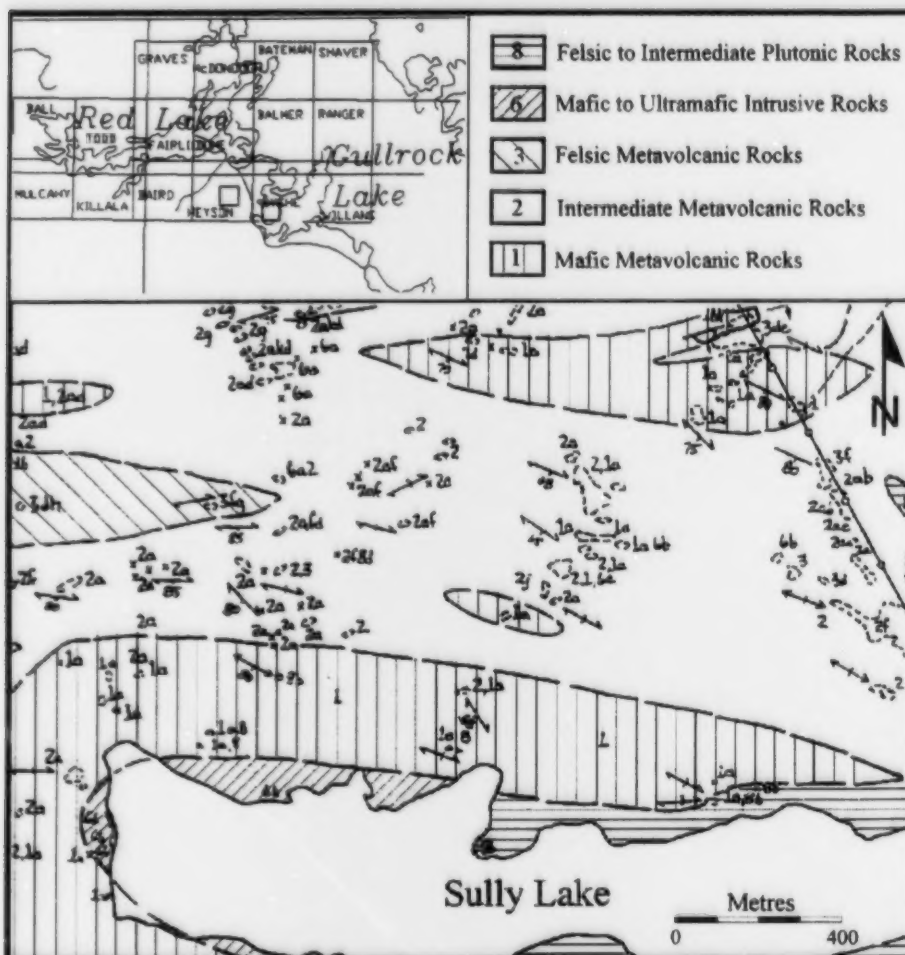


Figure 9. Gangloff property, Heyson township, after Atkinson 1993.

The prospect is located on claim KRL1205070, a 12-unit claim staked in 1999 and wholly owned by R. B. Gangloff. Mr. Gangloff has since done preliminary mapping and sampling on the property. He has also conducted over 8 line km of ground magnetometer geophysical survey over the majority of the land covered by claim KRL1205070, with the help of an OPAP grant in 1999.

Staff of the Red Lake Resident Geologist's office visited the property in November 1999, accompanied by Mr. Gangloff. The following account summarizes that visit, personal communication with Mr. Gangloff and publications referenced in the report.

Although outcrop exposures are generally good across most of the township, the area described in the following paragraphs was mostly covered by overburden. The geological summary by Atkinson and Storey (1994) and Loydex Resources Incorporated OPAP prospecting program #OP95-008 Final Submission report (Nelson 1995) were used to outline the general geology in the vicinity of the property.

The rocks underlying Mr. Gangloff's claim consist of felsic tuff and lapilli tuff, quartz and feldspar porphyries and massive intermediate flows of the Confederation assemblage of the Red Lake greenstone belt. Minor mafic dikes are present within the property. The rocks are pervasively biotite-altered and often contain disseminated pyrite and pyrrhotite. Sulphide mineralization, such as that observed by the author during the visit, found next to Sully Lake, usually occurs in the felsic metavolcanic rocks. According to Atkinson and Storey (1994), the Heyson calc-alkalic sequence underlies most of the township and includes a 1200 m thick unit of siliceous aphanitic felsic metavolcanic rocks, which trend northeast from the north side of Faulkenham Lake to Highway 105 in the east part of the township. These felsic rocks show a heterogeneous crystal texture, as well as a gradational change to a more tuffaceous character east-southeast of the Gangloff property. The felsic volcanism includes flow-banded flows, aphanitic siliceous flows, tuff, lapilli tuff, spherulitic flows and rare pyroclastic breccia. These rocks have similar characteristics to felsic rocks exposed on the Gangloff property. This suggests that the area in question may also have good base metal potential.

Only a small amount of assessment work has been recorded on this area. In the late 1980s, Charlamar Resources reported an exploration program consisting of stripping, trenching and sampling (Assessment Files, Red Lake Resident Geologist's office). Mapping and sampling of felsic metavolcanic rocks and channel sampling of the Killoran Creek sulphide occurrence was done in 1994 (Atkinson and Storey 1994) and Loydex Resources Inc. conducted a prospecting program in 1995, which included rock geochemistry. Although the "Sully Creek Project" led to the abandonment of the claims in question, the company retained the claims directly to the east of it. Preliminary mapping and sampling on the property indicates that a program of stripping and further sampling would be beneficial. The ground magnetometer survey indicates several magnetic anomalies worth further investigation.

In light of positive results obtained from the geophysical survey, Mr. Gangloff plans to continue the exploration program with trenching and stripping in the areas outlined by the survey.

Capital Lithium Mines - Root Lake 34 Claim Group (C. C. Storey)

The Capital Lithium Mines Root Lake property consists of two claim blocks--the "5 Claim Group" and the "34 Claim Group". The property was originally explored in 1955. In 1957, Capital Lithium Mines Ltd. carried out a ground magnetic and electrical resistivity geophysical survey over the 34 Claim Group (Assessment Files, Resident Geologist's Office, Red Lake). Five holes were subsequently diamond-drilled for a total of 3240 feet. These intersected numerous, white, muscovite-bearing pegmatites with abundant tourmaline. Two of the holes, numbers 2 and 5, intersected pegmatites reported to contain green beryl crystals up to 3 mm in size. Abundant, disseminated sulphides (estimated up to 7%) were encountered, predominantly consisting of pyrite and pyrrhotite, but chalcopyrite and bornite were reported, particularly in holes 1 and 3 (bornite was reported from hole 1 only). Recent timber cutting activity has provided road access and has uncovered large areas of bedrock. There is no evidence of any of the old reported exploration work either on the pegmatites or the sulphide occurrences.

Figure 10 shows the Root Lake pegmatite field, the geology being after Breaks et al. (1979). An attempt was made to sample pegmatites in the vicinity of Capital Lithium Mines diamond-drill holes 2 and 5 as a follow-up to work begun in 1998 (see *Rare-Metal Pegmatites of the Pakwash-Lake St. Joseph Trend* in Blackburn et al. 1999). None of the surface exposures of pegmatite examined had any visible spodumene or beryl (Figure 11). The pegmatites seen were very similar to those described from the Root Lake area by Blackburn et al. (1999). The host rock for the 34 Claim Group pegmatites is dark green, pillowed amphibolite-grade, mafic metavolcanic rocks and fine-grained, often rusty weathering, well foliated, biotite-quartz-feldspar rock interpreted by Breaks et al. (1979) to be a metasandstone. Garnet is common; in some outcrops it comprises 10% of the rock. Two, very rusty, sulphide-rich zones were located and assay

results for samples from these zones and other non-pegmatite samples are in Table 8. Samples of the pegmatite and associated rocks (99CS012 to 028 inclusive) were analysed for major and trace elements; the results are given in Tables 7 and 9.

Although the area examined has a large number of pegmatite dikes, they show relatively low levels of fractionation and considerable variations in element ratios. With the exception of 99CS024, all are low in lithium, and 99CS024 is only at the anomaly level established by Blackburn et al. (1999). Two samples (99CS013 and 016) contain zinc above the 1998 anomaly level. Element ratios are shown in Table 10. Four samples have Na₂O/K₂O ratios greater than 1; all have Rb/Sr greater than 1 but all have K/Rb greater than 100 (lowest value is 149.08 for 99CS022). The sulphide-bearing rocks analysed have elevated copper and zinc values. Further work on these occurrences is required to determine their potential for both rare-metal pegmatites and base metals.

Consolidated Morrison Explorations Ltd. Pegmatite Road Reconnaissance. (C. C. Storey)

The former Consolidated Morrison Explorations Ltd. pegmatite is located north of the Capital Lithium Mines 34 Claim group. The property was discovered in the 1950's. Exploration consisted of 16 diamond-drill holes totalling 6330.6 ft drilled along an east-trending zone approximately 4000 ft (1200 m) long in 1956. Spodumene-bearing pegmatites were reported from 12 of the holes. The host rocks are described as tuffaceous sediments, gneiss and amphibolite. No exploration work has been reported since, although a 15-claim unit was staked over this area in 1998.

During 1999, a preliminary reconnaissance was made along the winter road that crosses the southwest corner of the former Consolidated Morrison claim block (Figure 12). The winter road crosses an east-northeast-trending bedrock ridge, approximately 1500 m west of the presumed location of the Consolidated Morrison Explorations drill site. The rock exposed is dark green basalt. There is a well-developed foliation striking east and dipping steeply to the north. Minor sulphide mineralization is present in two locations, associated with an increase in intensity of the foliation. Sample descriptions are tabulated in Table 6. Assay results for three sulphide bearing samples are shown in Table 8. Major and trace element values are shown in Tables 7 and 9. Minor quartz veins are present in most of the outcrops, the veins following the foliation and often looking more like pegmatite material than quartz veins. A light grey, fine-grained feldspar porphyry dike was observed at Stop 5 (Figure 12). The dike occurs in the core of a steeply east-plunging isoclinal fold, which is the only folding observed. Approximately 20 m further south, a similar feldspar porphyry body—probably a dike—was observed in contact with the sheared, dark green basalt. The foliation strikes 110 to 115°, to which direction the dike is parallel. However, the width of this dike was not exposed.

The most significant mineralization is found at Stop 1 (Figure 12) where two narrow (i.e. 0.3 to 0.6 m) pegmatite dikes cut the basalt. These dikes strike 075°. The pegmatite is white, with abundant tourmaline. Tourmaline veins cut both the pegmatite and the basalt host rock. Three samples were taken from this outcrop—two of pegmatite and one of basalt. All three yield over 100 ppm Li. The two pegmatites are also enriched in Cs, Be and Ta (99CS047 156 ppm Li, 33.7 ppm Cs, 114 ppm Be, 94.1 ppm Ta, 99CS049 100 ppm Li, 25.1 ppm Cs, 78 ppm Be, 221.9 ppm Ta). These two samples have NaO/K₂O greater than 10 and low K/Rb ratios (9.56 and 13.56; Table 10). Photograph 1 was taken at Stop 1. This photo shows one of the two pegmatite dikes in the upper portion of the image (at the top end of the scale). Extensive tourmaline veins are found in the basalt host rock and along the contact between the basalt and the pegmatite.

The results indicate that these are highly fractionated pegmatites. The presence of two, although very narrow, fractionated dikes indicates that this area has excellent exploration potential for rare-metal pegmatites.



Photo 1. Tourmaline veins cutting basalt host and highly fractionated pegmatite from Consolidated Morrison Pegmatite road reconnaissance Stop 1. The pegmatite is the white rock at the top end of the scale.

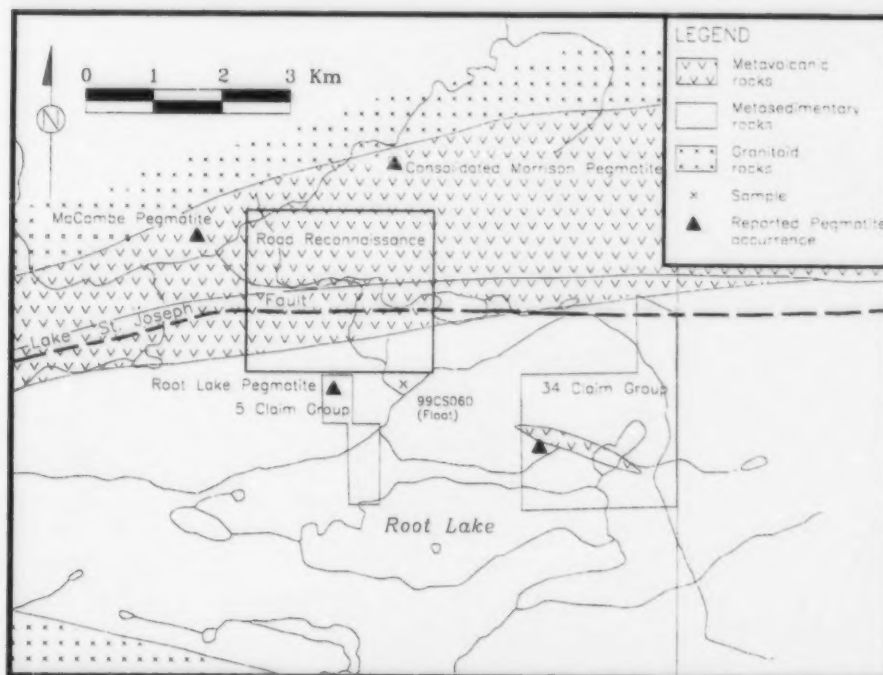


Figure 10. Root Lake pegmatite area.

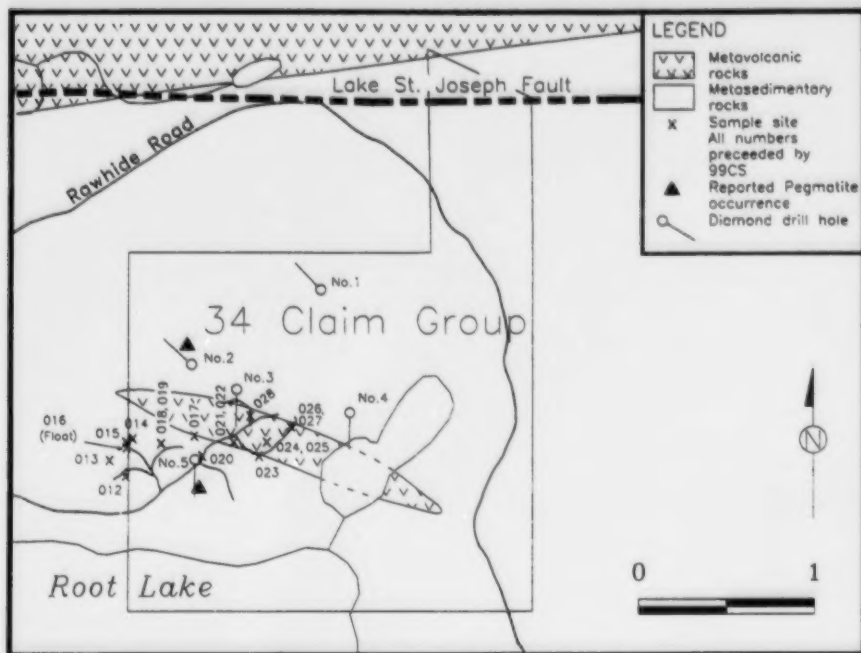


Figure 11. Capital Lithium Mines - Root Lake 34 Claim Group sample sites.

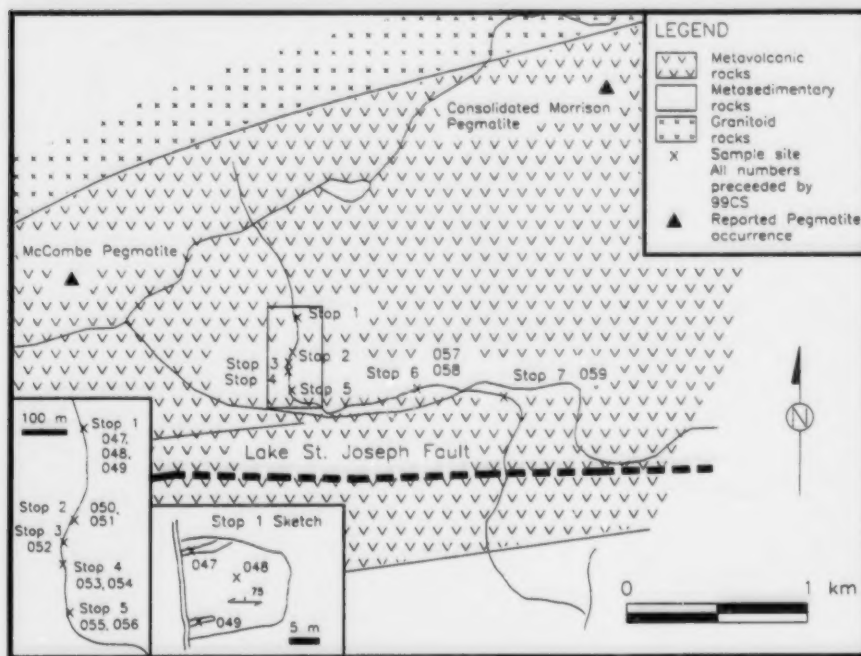


Figure 12. Consolidated Morrison Pegmatite road reconnaissance samples.

Table 6. Consolidated Morrison Reconnaissance samples.

Sample Number	Description	Location
99CS047	Tourmaline bearing pegmatite	Stop 1
99CS048	Dark green basalt with extensive tourmaline veins	Stop 1
99CS049	Tourmaline bearing pegmatite	Stop 1
99CS050	Dark green basalt	Stop 2
99CS051	Dark green basalt with tourmaline vein	Stop 2
99CS052	Dark green basalt with pegmatite like material in foliation	Stop 3
99CS053	Dark green basalt with tourmaline vein	Stop 4
99CS054	Rusty basalt with minor sulphides	Stop 4
99CS055	Light grey feldspar porphyry	Stop 5
99CS056	Rusty basalt with minor sulphides	Stop 5
99CS057	Rusty weathering dark green basalt with garnet and minor sulphides	Stop 6
99CS058	Rusty basalt with minor sulphides	Stop 6
99CS059	Dark green basalt with quartz vein in foliation	Stop 7

Table 7. Trace element analyses of Root Lake pegmatite area samples.

Analyte	Li	Cs	Be	Co	Cu	Mo	Ga	Nb	Rb	Sr	Sc	Sn	Ta	Th	V	Y	Zn	Zr
Method	1	4	3	3	3	3	4	4	4	4	3	4	4	4	3	4	3	4
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	3	0.01	3	5	5	8	1	0.02	0.01	0.02	1	3	0.01	0.02	5	0.5	2	1
99CS012 *	19																	
99CS013	23	5.46	N	N	N	16	17.4	6.6	204.1	6.9	2	5.3	1.12	1.26	N	3.22	163	11.2
99CS014 *	38																	
99CS016	8	10.4	5	N	N	N	17.0	6.81	128.9	37.2	3	8.4	1.67	1.61	N	6.08	53	43.4
99CS018	23	2.96	N	N	N	N	22.7	12	145.3	25.5	9	6.1	1.15	2.44	N	1.78	15	2.64
99CS018A		3.65					12.7	0.23	317.5	49.3		N	0.05	0.27		0.66		2.42
99CS020	24	6.77	4	N	N	N	18.8	10.5	123.9	26.5	4	5.5	1.65	2.34	N	2.6	23	10.3
99CS022	8	8.71	6	N	N	N	16.4	2.61	164.2	12.7	N	N	1.28	3.9	N	2.07	8	17.6
99CS023	17	7.45	N	N	N	N	12.9	2.88	319.6	22.1	2	N	0.58	0.87	N	2.57	10	10.5
99CS023A		8.84					12.9	0.19	>400	24.9		N	0.07	0.03		N		3.53
99CS024	49	4.14	N	N	N	N	20.7	9.98	125.3	9.6	4	5.9	0.99	0.46	N	0.82	17	2.36
99CS025	23	4.44	N	N	N	N	14.1	4.98	282.3	17.8	2	3.5	0.61	0.22	N	0.52	8	4.0
99CS047	156	33.7	114	10	N	N	44.3	14.7	364.5	93.3	6	17.1	94.1	3.8	43	6.17	65	28.2
99CS048 *	112	2.68	N	45	65	1	16.4	2.39	16.6	102	38	N	0.29	0.27	283	21.9	103	14.3
99CS049	100	25.1	78	N	N	N	40.5	29.5	263.1	74.8	N	8.1	221.9	3.22	6	2.85	24	16.6
99CS050 *	17	0.46	N	47	22	N	13.9	1.41	3.0	88.6	34	N	0.34	0.14	208	12.9	79	7.51
99CS051 *	19	1.12	3	45	39	N	12.6	1.48	5.13	71.8	35	9.3	0.14	0.15	221	15.6	95	12.7
99CS052 *	11	5.71	N	33	8	N	8.79	0.86	15.4	58.5	25	N	0.10	0.11	163	10.5	78	9.93
99CS053 *	25	38.9	N	34	14	N	12.9	7.01	43.25	1284.3	25	N	0.37	6.71	187	27.0	76	120.1
99CS055	66	9.83	N	5	N	N	20.4	3.84	52.02	192.5	3	N	0.38	3.09	30	4.38	56	139.0
99CS057 *	40	94.9	N	33	32	N	11.3	1.82	67.5	29.3	29	N	0.13	0.17	192	13.5	94	33.8
99CS059 *	25	79.0	N	39	105	N	12.2	1.42	66.4	132.0	28	N	0.13	0.17	185	13.9	59	16.9
99CS060	29	6.74	N	N	N	N	14.6	2.62	115.3	163.2	2	N	0.36	2.05	6	7.63	29	35.5

N means not detected, blanks indicate element not analyzed for

Analytical Methods: 1 - Atomic Absorption 2 - ED-XRF 3 - ICP-AES 4 - ICP-MS

Sample numbers with an asterisk (*) are mafic metavolcanic rocks, all others are pegmatite or felsic intrusive rocks

99CS016 and 99CS060 are samples of pegmatite float, 99CS055 is a feldspar porphyry dike

99CS018A and 99CS023A are potassium feldspar samples

RED LAKE DISTRICT—1999

Table 8. Precious and base metal assay results from the Root Lake pegmatite area.

Detection Limit Sample	Au ppb 5	Cu ppm 2	Pb ppm 3/0.1	Zn ppm 5	Pt ppb 8	Pd ppb 8
99CS015	N.D.	64	N.D.	243	N.D.	N.D.
99CS017	N.D.	108	N.D.	108	10	9
99CS026	N.D.	250	N.D.	348	N.D.	N.D.
99CS028	17	24	N.D.	59	N.D.	N.D.
99CS054	12	42.9	1.38	107	N.D.	N.D.
99CS056	5	94	1.33	107	10	10
99CS058	26	98.4	2.19	76	9	11

N.D. not detected

Pb analyses for samples 99CS054,56,58 were done by ICP-MS rather than XRF and have a lower detection limit of 0.1 ppm

Table 9. Major element analyses of pegmatite and potassium feldspar samples

Analyte Units Detection Limit	SiO ₂ wt% 0.01	Al ₂ O ₃ wt% 0.01	MnO wt% 0.01	MgO wt% 0.01	CaO wt% 0.01	Na ₂ O wt% 0.01	K ₂ O wt% 0.01	P ₂ O ₅ wt% 0.01	TiO ₂ wt% 0.01	Fe ₂ O ₃ wt% 0.01	LOI wt% 0.05	TOTAL wt% n/a	Feldspar type*
99CS013	74.06	14.36	0.05	0.14	0.37	4.22	4.53	0.16	0.01	0.65	0.76	99.31	
99CS016	76.63	15.11	0.03	0.20	0.59	2.30	3.21	0.19	0.03	0.79	1.64	100.72	
99CS018	75.62	14.85	0.01	0.24	0.29	4.09	3.48	0.09	0.03	0.49	1.22	100.66	
99CS018A	66.23	18.53	N.D.	0.07	0.29	4.11	10.24	0.17	N.D.	N.D.	0.38	100.02	Micro, Low Alb
99CS020	75.61	14.38	0.01	0.21	0.68	5.06	3.00	0.13	0.03	0.65	0.73	100.49	
99CS022	73.53	15.10	0.04	0.11	0.83	6.17	2.95	0.19	0.01	0.36	0.45	99.74	
99CS023	75.52	15.14	N.D.	0.12	0.12	2.79	8.72	0.19	0.01	0.22	0.55	100.38	
99CS023A	66.07	18.75	N.D.	0.06	0.09	3.00	12.31	0.24	N.D.	N.D.	0.28	100.80	Micro, Low Alb
99CS024	77.35	14.08	0.01	0.15	0.51	4.61	2.30	0.10	0.02	0.50	1.02	100.65	
99CS025	73.84	15.17	N.D.	0.12	0.08	2.45	8.25	0.15	0.01	0.24	0.69	101.00	
99CS047	60.13	20.54	0.16	1.83	2.71	4.55	0.42	0.20	0.24	3.86	1.51	96.15	
99CS049	72.20	15.34	0.14	0.43	2.47	4.89	0.43	0.04	0.05	1.01	0.95	97.95	
99CS055	70.29	15.82	0.03	0.91	3.28	4.79	1.08	0.07	0.32	2.46	0.58	99.63	
99CS060	74.81	14.83	0.01	0.34	0.76	2.50	5.23	0.14	0.06	0.74	1.01	100.43	

N.D. means not detected

* Minerals present, as determined by X-ray diffraction, in order of decreasing abundances Alb: albite; Micro: microcline

99CS016 and 99CS060 are samples of pegmatite float, 99CS055 is a feldspar porphyry dike

99CS018A and 99CS023A are potassium feldspar samples

Table 10. Element ratios for pegmatite and feldspar samples

SAMPLE	Na ₂ O/K ₂ O	Rb/Sr	K/Rb	K/Cs
99CS013	0.93	29.58	184.18	6886.3
99CS016	0.72	3.46	206.71	2566.8
99CS018	1.17	5.69	198.78	9758.1
99CS018A		1.44	267.69	23285.5
99CS020	1.69	4.67	200.98	3677.9
99CS022	2.09	12.93	149.08	2811.1
99CS023	0.32	14.46	226.43	9714.9
99CS023A			-	11558.0
99CS024	2.00	13.04	152.03	4601.4
99CS025	0.29	15.86	242.60	15422.3
99CS047	10.80	3.91	9.56	103.4
99CS049	10.83	3.52	13.56	142.2
99CS055	4.43	0.27	172.32	911.9
99CS060	0.48	0.71	376.49	6440.5

99CS016 and 99CS060 are samples of pegmatite float, 99CS055 is a feldspar porphyry dike

99CS018A and 99CS023A are potassium feldspar samples

RECOMMENDATIONS FOR EXPLORATION

Rare-Metal Pegmatites

A rare-metal pegmatite is currently being explored at Pakeagama Lake on the Bearhead Fault that separates the Berens River and Sachigo subprovinces in the Red Lake District. Breaks, Tindle and Smith (1998, 1999) carried out extensive research on the Pakeagama Lake pegmatite. In other parts of the Bearhead Fault zone, mapping by Ayres (1970) indicated beryl southwest of Setting Net Lake and a compilation by Ayres et al. (1973) indicated lithium at two locations in the same area. Recent mapping by Stone, Crawford and Halstead (1993) and Stone, Fogal and Fitzsimon (1993) confirmed this. The entire Bearhead Fault zone warrants exploration for rare-metal pegmatites, particularly in the area between Favourable Lake and Pakeagama Lake.

Blackburn et al. (1999) recommended exploration for rare-metal pegmatites along the south margin of the Uchi subprovince (i.e. the Pakwash-Lake St Joseph Trend). Work in the Root Lake area has indicated the presence of highly fractionated pegmatites accompanied by anomalous lithium, beryllium, cesium and tantalum. Spodumene and beryl had been reported from this area by past exploration activities (Blackburn et al. 1999) but there has been no reported exploration since the 1950's. The metavolcanic rocks north of the Lake St Joseph Fault in the Root Lake area therefore represent an excellent target area for rare-metal pegmatites.

Gold

The greenstone belts north of 51°N have been historically under explored. They offer significant precious and base metal potential, as evidenced by mining and exploration activities of the past. Average grades for four of the known deposits are: 1.151 ounces per ton gold at the Sachigo River Mine; 0.28 ounce per ton gold plus silver, lead and copper at the Berens River Mine; 0.56 ounce per ton gold at the Bathurst Mine; and 0.24 ounce per ton gold at the Lingman Lake property. While the challenges of exploration in this area are considerable, the potential for returns are enormous.

There are several gold deposits at the west end of the Red Lake greenstone belt. These include the West Red Lake, Miles Red Lake, May-Spiers, Cole, Mount Jamie, Heath and others. The western end of the Red Lake greenstone belt is crossed by three deformation zones: the Middle Bay Deformation Zone, the Trout Bay Deformation Zone and the St Paul Bay-Pipestone Bay Deformation Zone. The deformation zones have long been considered the loci for gold mineralization in the Red Lake Camp. In the west end of the belt, several gold deposits with published reserves are found in two of the three deformation zones mentioned above (Table 12). Work at the West Red Lake property described above, and work by Parker (1999a), indicate that the west end of the Red Lake belt has good potential for gold exploration.

OGS ACTIVITIES AND RESEARCH BY OTHERS

The locations of the following projects are shown in Figures 5 and 6.

Four projects were undertaken by the Ontario Geological Survey in the Red Lake District in 1999. The projects are an integral part of the NATMAP (National Mapping Program), a collaboration with the Geological Survey of Canada.

A) J. Parker, Precambrian Geoscience Section, completed the second year of a multi-year study of the regional metallogeny of the Northwestern Superior Province, with emphasis on volcanogenic massive sulphide (VMS) mineralization and gold. Fieldwork in the Red Lake greenstone belt was completed on the following areas: the volcanology and VMS potential of the Confederation and Balmer assemblages; and in the west end of the Red Lake greenstone belt reconnaissance mapping of alteration and gold mineralization in Ball, Todd and Fairlie townships (Parker 1999a, 1999b).

B) J.R. Devaney, Precambrian Geoscience Section, completed the second year of a multi-year sedimentological and volcanological study of the southwest Birch-Uchi Greenstone Belt of the Uchi Subprovince (Devaney 1999).

C) F.W. Breaks, Precambrian Geoscience Section, A.G. Tindle, S.R. Smith and S.P. Kelley of The Open University, Milton Keynes, UK, continued the second year of field and laboratory investigations, which included laser $^{40}\text{Ar}/^{39}\text{Ar}$ dating of the muscovites on the Pakeagama Lake Pegmatite. The Pakeagama Lake Pegmatite is a highly-evolved, complex-type, petalite-subtype rare-element mineralization in the Berens River-Sachigo Subprovince Boundary Zone. Pakeagama Lake is located 160 km north of Red Lake (Breaks, Tindle and Smith, 1999, Smith et al., 1999).

D) D. Stone, Precambrian Geoscience Section, continued 1:50 000 scale regional mapping in the northern Superior Province, in the Sherman River and Withers Lake areas, approximately 350 km north of Red Lake (Stone, Halle and Lange 1999).

Other studies include the following, which are an integral part of the NATMAP program and also support LITHOPROBE (Western Superior Transect).

E) M. Sanborn-Barrie and T. Skulski, (Geological Survey of Canada) began a regional analysis of the Red Lake greenstone belt (Percival et al. 1999).

F) B. Dube and W. Balmer (Geological Survey of Canada) began a study of the amphibolite-grade, replacement style mineralization of the Madsen gold deposit, in the Red Lake greenstone belt (Percival et al. 1999).

G) N. Rogers, C. van Staal, and K.Y. Tomlinson (Geological Survey of Canada) continued detailed structural mapping and lithogeochemical studies of the Confederation-Woman lakes area in the Confederation-Uchi greenstone belt (Percival et al. 1999).

Table 11. Publications received by the Red Lake Office in 1999.

Title	Author	Type and Year of Publication
Summary of Field Work and Other Activities 1998	Edited by J.A. Ayer, C.L. Baker, J.C. Ireland, R.I. Kelly, and P.C. Thurston	OGS, Miscellaneous Paper 169, 285p., 1999
The application of water and soil geochemistry to detect blind mineralization in areas of thick overburden	R.G. Jackson	OGS, Open File Report 5927, 1995
Geology of nickel-copper-chromite deposits and cobalt-copper deposits at Werner-Rex-Bug Lakes, English River Subprovince, Northwestern Ontario	J.R. Parker	OGS, Open File Report 5975, 1998
Quaternary geology of the Separation Lake Area, Northwestern Ontario	T.F. Morris	OGS, Open File Report 5980, 1999
Report of Activities 1998, Resident Geologist Program - Red Lake-Kenora Districts	C.E. Blackburn, P. Hinz, C.C. Storey, L. Kosloski and C.B. Ravnaas	OGS, Open File Report 5987, 88p., 1999
Report of Activities 1998, Resident Geologist Program - Thunder Bay North and Sioux Lookouts Districts	J.K. Mason, G. Seim, G.D. White, M.S. O'Brien, D. Farrow, A. Walden and C. Komar	OGS, Open File Report 5988, 54p., 1999
Report of Activities 1998, Resident Geologist Program - Thunder Bay South District	B.R. Schneiders, J.F. Scott, M.C. Smyk and M.S. O'Brien	OGS, Open File Report 5989, 59p., 1999
Report of Activities 1998, Resident	B.T. Atkinson, M.H. Hailstone, R.	OGS, Open File Report 5990, 111p., 1999

Geologist Program - Timmins and Sault Ste. Marie Districts	Pressacco, A.C. Wilson, D.M. Draper, P. Hope, P.M. Morra and D.C. Egerland	
Report of Activities 1998, Resident Geologist Program - Kirkland Lake and Sudbury Districts	G. Meyer, M.C. Cosec, G.P.B. Grabowski, D.L. Guindon and S.D.M. Gosselin	OGS, Open File Report 5991, 74p., 1999
Report of Activities 1998, Resident Geologist Program - Southeastern and Southwestern Districts, Mines and Minerals Information Centre, and Petroleum Resources Centre	P.J. Sangster, W.J. McGuinty, V.C. Papertzian, K.G. Steele, C.R. Lee, D.A. Laidlaw, J.M. Stewart and T.R. Carter	OGS, Open File Report 5992, 76p., 1999
Summary of Field Work and Other Activities 1999	Edited by J.A. Ayer, C.L. Baker, R.I. Kelly, G.M. Stott and P.C. Thurston	OGS, Open File Report 6000, p.23-1 to 23-13., 1999
Quaternary Geology, Lemna Lake area	T.F. Morris	OGS, Map 2547, 1999
Quaternary Geology, Umfreville Lake area	T.F. Morris	OGS, Map 2548, 1999
Precambrian geology, Ellard Lake Area	D. Stone, J. Halle, M. Lange, and E. Chaloux	OGS, Preliminary Map P.3188, 1999
Precambrian Geology, Pasquatchai River Area	D. Stone, J. Halle, M. Lange, and E. Chaloux	OGS, Preliminary Map P.3189, 1999
Detailed Precambrian geology, alteration and mineralization of the Almo Lake area, western English River Subprovince	J.R. Parker	OGS, Preliminary Map P.3313-Revised, 1998
Detailed Precambrian geology, alteration and mineralization of the Gordon Lake area, western English River Subprovince	J.R. Parker	OGS, Preliminary Map P.3314-Revised, 1998
Detailed Precambrian geology, alteration and mineralization of the Werner Lake area, western English River Subprovince	J.R. Parker	OGS, Preliminary Map P.3315-Revised, 1998
Detailed Precambrian geology, alteration and mineralization of the Upper Fortune Lake area, western English River Subprovince	J.R. Parker	OGS, Preliminary Map P.3316-Revised, 1998
Detailed Precambrian geology, alteration and mineralization of the Rex Lake area, western English River Subprovince	J.R. Parker	OGS, Preliminary Map P.3317-Revised, 1998
Detailed Precambrian geology, Bug Lake, western English River Subprovince	J.R. Parker	OGS, Preliminary Map P.3380, 1998
Precambrian geology, Medicine Stone Lake Area	B.T. Atkinson	OGS, Preliminary Map P.3397, 1999
Heavy mineral indicator database derived from overburden for kimberlite, metamorphosed magmatic massive sulphides and gold, Stull Lake area, northwestern Ontario	D. Stone, T.F. Morris and D.C. Crabtree	OGS, Miscellaneous Release - Data 45, 1999
Ontario airborne magnetic and electromagnetic surveys, processed data and derived products: Archean and Proterozoic "Greenstone" Belts - Birch-Confederation Lakes Area		OGS, ERLIS Data Set 1025, 1997
Ontario airborne magnetic and electromagnetic surveys, processed data and derived products: Archean and Proterozoic "Greenstone" Belts - Uchi-Bruce Lakes Area		OGS, ERLIS Data Set 1026, 1997

Ontario airborne magnetic and electromagnetic surveys, processed data and derived products: Archean and Proterozoic "Greenstone" Belts - Red Lake Area		OGS, ERLIS Data Set 1028, 1998
Ontario airborne magnetic and electromagnetic surveys, processed data and derived products: Archean and Proterozoic "Greenstone" Belts - Ontario Magnetic Supergrids		OGS, ERLIS Data Set 1037, 1999
Recent advances in the geology and structure of the Confederation Lake region, northwestern Ontario	N. Rogers, C.R. van Staal, and V. McNicoll	GSC, Current Research 1999-C, p. 187-195, 1999
Surficial Geology of the Red Lake-Confederation Lake Area, Ontario	H.A.J. Russell, D.R. Sharpe and P. Stacey	GSC, Open File D3744, 1999
Final Report on the Geological Survey of Canada Bedrock Geoscience Program Workshop February 23-25, 1997	Stephen Lucas (Co-ordinator)	GSC, Miscellaneous Report 65, 39 p., 1999
Origin and Evolution of Peraluminous Granite and Rare-Element Pegmatite in the Dryden Area, Superior Province of Northwestern Ontario	Frederick William Breaks	Unpublished Ph.D. Thesis, Carleton University, 594p, 1989
Structural and Alteration History of the Buffalo Gold Deposit, Red Lake, Ontario	Neil Pettigrew	Unpublished B.Sc. Thesis, University of New Brunswick, 154p, 1999
Granitic Pegmatites in Science and Industry	Edited by P. Cerny	Mineralogical Association of Canada, Short Course Handbook, Volume 8, May 1982
Granitic Pegmatites	Editors R.F. Martin and P. Cerny	The Canadian Mineralogist, Volume 30, Part 3, p. 497-954, September 1992
Granitic Pegmatites: The Cerny-Foord Volume		The Canadian Mineralogist, Volume 36, Part 2, p. 249-680, April 1998
Bear Attacks - The Deadly Truth	James Gary Shelton	1998, p.273
Bear Encounter Survival Guide	James Gary Shelton	1994, p.230
Mineral Collecting in Ontario - A guide for rockhounds	Ontario Printer	17p., 1999
Planned Workplace Inspections for Mineral Exploration Projects	Mines and Aggregates Safety and Health Association	37p., 1999
Field geophysics (2 nd Edition)	John Milsom	187p., 1996
Mining Explained - A Layman's Guide	J. Whyte, and V. Danielson, Editors	The Northern Miner, 150p, 1998

Table 12 Mineral deposits not being mined in the Red Lake District in 1999.

Abbreviations					
AF	Assessment Files	MLS	Mining Lands, Sudbury		
CMH	Canadian Mines Handbook	MR	Mining Recorder		
GR	Geological Report	NM	The Northern Miner		
MDC	Mineral Deposit Circular	OFR	Open File Report		
MDIR	Mineral Deposit Inventory record	PC	Personal Communication		

Deposit Name/ NTS	Comme-ity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Abino Bateman, Balmer and Dome Townships (52N/04SW)	Au	Total Granodiorite Zone drill indicated tonnage 405 162 tons 0.203 opt Au from three sub-zones (McClean 1976)	Goldcorp Inc.	AF	Patent
Aiken-Russet Baird Township (52K/13NW)	Au	Total reserves of 102 555 tons of 0.22 opt Au	Claude Resources Inc.	AF	Patent
Alcourt (Copper Man, Hanson- Campbell) Fairlie Township (52N/04SW)	Au	Reserves: 20 000 tons of 0.45 opt Au (Tilsley 1981) from 1959-60 diamond drilling No. 1 vein - 17 000 tonnes 0.2429 oz per tonne Au (Tilsley 1981) from 1959- 60 diamond drilling and 1981 sampling program	Unknown	AF	Patent
Annco Mine Dome Township (52N/04SW)	Au	Reserves: 50 000 tons "Excellent Grade" (0.35 opt Au?)	Goldcorp Inc.	OFR Energy Mines and Resources Canada 1989	Patent
Bathurst Mine Skinner Township (52N/07SW)	Au	Reserves: 80 000 tons of 0.587 opt Au	Unknown	Energy Mines and Resources Canada 1989	Leased
Berens River Mine (Golsil, Zahavy) (53C/13SE)	Au, Ag, Pb, Zn	Reserves: No. 1 Zone - 75 000 tons 0.1 - 0.2 opt Au, 4.0 - 5.0 opt Ag No. 3 Zone - 982 213 tons 0.26 opt Au, 4.8 opt Ag, 0.77% Pb, 1.12% Zn (713 249 tons indicated, 268 964 tons inferred) at 0.15 opt Au cut-off to 750 metre level	Unknown	MDIR AF - (Bevan, 1983)	Leased
Bluffy Lake (52K/14SE)	Fe	Reserves: 21 000 000 tons at 22.86% Fe	Unknown	Prelim. Map P.1199	Licence of Occupation
Borland Lake (53D/16NE)	Ag, Au	Probable Reserves: 502 412 tons of 8.09 opt Ag and 0.02 opt Au	Unknown	Massive Resources Ltd. Preliminary Prospectus - August 6, 1987	Leased
Buffalo Red Lake Heyson Township (52N/04SW)	Au	Reserves: 421 728 tonnes of 0.139 opt Au drill indicated in 1980	Claude Resources Inc.	MDIR	Patent
Cochénour Willans		Reserves: Proven and		NM - Dec. 12, 1994	Patent

RED LAKE DISTRICT—1999

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Mine Dome Township (52N/04SW)	Au	probable 173 000 tons of 0.51 opt Au, possible reserves 274 000 tons of 0.59 opt Au	Goldcorp Inc.	p.7	Licence of Occupation
Cole Gold Mine Ball Township (52M/01SE)	Au	Reserves: 119 780 tons of 0.41 opt Au probable and indicated (Wilton, 1973)	The Cole Gold Mines Ltd.	AF	Patent Licence of Occupation
Consolidated Marcus Dome Township (52N/04SW)	Au	Reserves: 60 000 tons of 0.18 opt Au	Goldcorp Inc.	Energy Mines and Resources Canada 1989	Patent
Copper Lode A – Rexdale Group Prospect (52K/15NW)	Cu, Ag	Reserves: 236 424 tons of 1.94% Cu, 1.22 opt Ag or 425 612 tons of 1.56% Cu, 0.98 opt Ag or 854 007 tons of 1.01% Cu, 0.57 opt Ag	P. English	AF MP152	Staked Claim
Copper-Lode D Belanger Township (52K/15NW)	Cu, Zn	Reserves: 36 000 tons of 0.26% Cu, 7.58% Zn	Noranda Mining and Exploration Inc.	AF	Leased
Copper-Lode E Belanger Township (52K/15NW)	Cu, Ag	Reserves: 160 000 tons 8.28% Zn, 1.02% Cu, 0.39 opt Ag	Noranda Mining and Exploration Inc.	AF	Leased
Dixie Creek (52K/13SE)	Au	Reserves: 417 000 tons of 0.126 opt Au	Perry English	AF	Staked Claim
Dixie 3 Prospect (52K/14NW)	Cu, Zn	Reserves: 91 000 tons of 10.0% Zn, 1.0% Cu	Noranda Mining and Exploration Inc.	AF	Leased - Mining Rights Only Staked Claim
Dixie 18 Prospect (52K/14NW)	Zn	Reserves: 110 000 tons of 0.5% Cu, 12.5% Zn	Noranda Mining and Exploration Inc.	AF	Staked Claim
Grassett Prospect Earngey Township (52N/02SE)	Au	Reserves: 78 295 tons of 0.22 opt Au (Part of the Hill-Sloan-Tivy Vein)	Lac Properties Inc.	Energy Mines and Resources Canada 1989	Patent
Griffith Mine (52K/14SW)	Fe	Reserves: 120 000 000 tons of 29% Fe	Unknown	GR82	Patent
Hasaga Mine Heyson Township (52N/04SW)	Au	Reserves: C Block (below 1800 feet) 200 203 tons of 0.192 opt Au Stopes - 41 430 tons of 0.104 opt Au Pillars - 6 365 tons of 0.134 opt Au	Lac Properties Inc.	GR56	Patent
Hill-Sloan-Tivy Earngey Township (52N/02SE)	Au	Reserves: 296 000 tons of 0.219 opt Au (Grassett Prospect Reserves may be included in total)	Unknown	AF	Patent
Horseshoe Island (52N/08NW)	Au	Reserves: 893 508 tons of 0.14 opt Au	Bryan Patrie	Northwest Prospector, March/April 1990, p.27	Staked Claim

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Howey Mine Heyson Township (52N/04SW)	Au	Reserves: 780 000 tons of 0.08 opt Au	Teck Corporation	Energy Mines and Resources Canada 1989	Patent Licence of Occupation
Jackson-Manion Mine Dent Township (52N/02SE)	Au	Reserves: 40 000 tons of 0.5 opt Au	Unknown	NM - March 14, 1985, p.21	Patent
Joy - New Zone (Diamond Willow Zone, Creek Zone) (52K/14NW)	Cu, Zn	Reserves: 300 000 tons of 4% combined Cu-Zn	Noranda Mining and Exploration Inc.	AF	Staked Claim
Kesaka Lake (52K/16NW)	Fe	Reserves: 312 500 000 tons of 31.1% Fe to a depth of 100 feet	Unknown	ODM Annual report Vol. 48, pt. 8, p. 1- 43	Leased
Lavery (Thrall) Heyson Township (52N/04SW)	Au	Reserves: Speculative reserves from the Diabase dike zone: 329 000 tons of 0.08 opt Au or 75 000 tons of 0.15 opt Au	Unknown	AF	Patent
Lingman Lake (53F/15SW)	Au	Reserves: 1 172 753 tons of 0.20 opt Au in all zones at 5.0 foot minimum width and a cut-off grade of 0.08 opt Au (McPhee, 1989)	Wolfden Resources Inc.	AF	Patent
May-Spiers Ball Township (52M/01SE)	Au	Reserves: 30 000 tons of 0.09 opt Au	T. Maciejewski	AF	Staked Claim
McCombe (Root Lake) (52J/13NE)	Lithia	Reserves: 2.3 million tons of 1.3% Lithia to the 500 foot level	Unknown	MP90	Patent Licence of Occupation
McFinley Mine Bateman Township (52N/04SE)	Au	Preliminary Reserves: 890 000 tons of 0.21 opt Au	McFinley Red Lake Mines Ltd.	CMH	Patent Licence of Occupation
Mount Jamie Todd Township (52M/01SE)	Au	Reserves: Main Zone - 47 048 tons of 0.425 opt Au No. 2 Shaft area - 25 360 tons of 0.37 opt Au	Claude Resources Inc.	AF	Patent
My-Ritt (Coin Lake) Heyson Township (52N/04SW)	Au	Unknown	My-Ritt Red Lake Gold Mines Ltd.	OFR 5558	Patent
New Faulkenham Mines Ltd. (Faulkenham Lake) Baird Township (52K/13NW)	Au	Reserves: 15 000 tons of 0.428 opt Au (\$15.00 at \$35.00 per ounce Au - Holbrooke, 1958)	Claude Resources Inc.	AF	Patent
North Spirit Lake (Crown Trust) (53C/07NW)	Fe	Reserves: 1.3 million tons per vertical foot of 33.94% Fe	Unknown	ODM Annual Report Vol.47, Pt. 7, p.44-78 GR150	Patent

RED LAKE DISTRICT—1999

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Northgate Prospect Eamgey Township (52N/02SE)	Au	Reserves: 64 600 tons of 0.28 opt Au	P. English/J. Green	AF	Staked Claim
Ogani Lake (52K/15NE)	Fe	Reserves: 100 000 000 tons of 21.6% Fe	Crown	AF	Open
Papaonga Lake (52K/16NE)	Fe	Reserves: 13 500 000 tons of 31.06% Fe	Crown	MDIR	Open
Red Crest (Red Summit) Todd Township (52M/01SE)	Au	Reserves: 47 439 tons of 0.269 opt Au (uncut grade) - Horwood, 1945 38 000 of 0.3 opt Au	Claude Resources Inc.	NM - March 14, 1985,p.21 DoM Annual Report vol. 49, pt. 2, 1940	Patent
Redaurum Baird Township (52N/04SW)	Au	Possible Reserves: 14A Zone - 243 750 tons 0.22 opt Au 26 250 tons 0.20 opt Au No. 2 Zone - 137 500 tons of 0.18 opt Au No. 3 Zone - 102 500 tons of 0.18 opt Au Camp Zone - 24 750 tons of 0.13 pt Au	Sabina Resources Ltd. (80%) and Redaurum Ltd. (20%)	AF	Patent
Richardson (Kostynuk Bros. Mine) (52N/09SW)	Au	Reserves: 700 000 tons of 0.2 opt Au inferred reserves	Unknown	OFR 5835	Patent
Rowan Todd Township (52M/01SE)	Au	Reserves: 10 900 tons of 0.657 opt Au (\$23.00 a ton at \$35.00 per ounce)	Goldcorp Inc.	AF	Patent
Sanshaw (Whitehorse Island) Dome Township (52N/04SW)	Au	Reserves: 175 000 tons of 0.20 opt Au	Bonanza Red Lake Explorations Inc.	NM - June 11, 1953	Patent Licence of Occupation
Setting Net Lake (53C/13SE)	MoS ₂	Reserves: 100 000 000 tons of 0.09% MoS ₂	Crown	MDIR NM - March 23, 1973	Open
Sol-D'Or Honeywell Township (52N/07SE)	Au	Reserves: 8 565 tons of 0.57 opt Au	Crown	Energy Mines and Resources Canada 1989	Unknown
Springpole Lake Prospect (52N/08NW)	Au	Reserves: Portage Zone - 7.9 million tons of 0.07 opt Au 27 million tons of 0.035 opt Au including 4 million tons of 0.091 opt Au and 405 000 tons of 0.14 opt Au	Gold Canyon Resources Inc.	OFR 5835	Patent Staked Claims
Starratt-Olsen Mine Baird Township (52K/13NW)	Au	Reserves: 15 000 of 0.45 opt Au	Claude Resources Inc.	NM - July 26, 1973 MDIR	Patent
Trout Bay Zinc Pit Zone	Zn, Cu, Pb, Ag, Au	Reserves: West Zone - 13 776 tons of 4.75% Zn,	Goldcorp Inc.	MP147 Preliminary Map	Patent (Mining Rights Only),

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Mulcahy Township (52M/01SE)		0.68% Cu, 0.94 opt Ag East Zone - 124 760 tons 7.86% Zn, 1.5% Cu, 0.24% Pb, 1.7 opt Ag, 0.007 opt Au		P.567 MDIR	Leased (Mining Rights Only, Licence of Occupation)
Uchi Mine Earngey Township (52N/02SE)	Au	Reserves: 214 000 tons of 0.147 opt Au	Lac Properties Inc.	Energy Mines and Resources Canada 1989	Patent
Wilmar Mine Dome Township (52N/04SW)	Au	Reserves: Quoted from Durocher et al 1987 unless indicated otherwise Diorite Dike Zone - 140 000 tons of 0.21 opt Au East Breccia Zone - 31 500 tons of opt Au (Proven) - 50 500 tons of 0.25 opt Au (Probable) - 1 777 000 tons of 0.24 opt Au (Possible) Carbonate Zone - 25 000 tons of 0.17 opt Au (Probable) - 7 500 tons of 0.15 opt Au (Possible) West Granodiorite Zone - 3.15 to 4.5 million tons of 0.076 to 0.131 opt Au (EMR Canada, 1989) Granodiorite Zone - 5 700 000 tons of 0.10 to 0.15 opt Au	Goldcorp Inc.	OFR 5558 Energy Mines and Resources Canada 1989	Patent
Woco Vein Earngey Township (52N/02SE)	Au	Reserves: 21 263 tons of 0.80 opt Au	St. Jude Resources Ltd.	AF	Staked Claims
Young, H.G. Mines Ltd. Balmer Township (52N/04SW)	Au	Reserves: 270 000 tons of 0.31 opt Au	Placer Dome North America	OFR 5558	Patent

REFERENCES

- Atkinson, B.T., 1993. Precambrian geology of Heyson Township; Ontario Geological Survey, Preliminary Map P.3197, scale 1:12 000.
- Atkinson, B.T. and Storey, CC 1994. Recommendations for exploration in the Red Lake District; *in* Summary of Field Work and Other Activities, Ontario Geological Survey Miscellaneous Paper 163 p.143-146.
- Ayres, L.D. 1970. Setting Net Lake area, District of Kenora (Patricia Portion); Ontario Department of Mines, Preliminary Map P.538 (revised).

RED LAKE DISTRICT—1999

- Ayres, L.D., Raudsepp, M., Averill, S.A. and Edwards, G.R. 1973, Favourable Lake-Berens Lake geological compilation series; Ontario Division of Mines, Map 2262.
- Blackburn, C.E., Hinz, P., Storey, C.C., Kosloski, L. Ravanaas, C.B. 1999. Report of activities 1998, Resident Geologist program, Red Lake Regional Resident Geologist report: Red Lake and Kenora Districts; Open File Report 5987, 88p.
- Breaks, F.W., Bond, W.D., Stone, D., and Desnoyers, D.W. 1979 Operation Miniss-Tully Lakes, Root Lake sheet, Districts of Kenora and Thunder Bay; Ontario Geological Survey, Preliminary Map P.2215, scale 1:63 360.
- Breaks, F.W., Tindle, A.G. and Smith, S.R. 1998. Rare-metal mineralization associated with the Berens River-Sachigo subprovincial boundary, northwestern Ontario: discovery of a new zone of, complex-type, petalite-subtype pegmatite and implications for future exploration; *in* Summary of Field Work and Other Activities 1998, Ontario Geological Survey, Miscellaneous Paper 169, p.168-182.
- Breaks, F.W., Tindle, A.G. and Smith, S.R. 1999. The Pakeagama Lake Pegmatite: Continued field and laboratory investigation of highly evolved, complex-type, petalite-subtype rare-element mineralization in the Berens River-Sachigo Subprovince Boundary Zone; *in* Summary of Field Work and Other Activities 1999, Ontario Geological Survey, Open File Report 6000, p.26-1 to 26-12.
- Devaney, J.R. 1999. Sedimentological and volcanological studies of the southwest Birch-Uchi greenstone belt, Uchi Subprovince; *in* Summary of Field Work and Other Activities 1999, Ontario Geological Survey, Open File Report 6000, p.18-1 to 18-11.
- Durocher, M.E., Burchell, P.S., Wallace, H., Andrews, A.J., Hugon, H. and Atkinson, B.T. 1991. Geology and gold mineralization, Red Lake greenstone belt; Ontario Geological Survey, Preliminary Map P.3107, scale 1:50 000.
- Ferguson, S.A. 1965. Geology of the eastern part of Baird Township, Ontario Department of Mines, Report 39, 47p.
- Horwood, H.C. 1945. Geology and mineral deposits of the Red Lake area; Ontario Department of Mines, Annual Report, 1940, v.49, pt 2.
- Nelson, L. 1995. Prospecting program OPAP final submittal: Killoran Creek prospect, Loydex Resources Inc.; Red Lake Resident Geologist's office, Heyson Township assessment file, OP95-008, 20 p.
- Parker, J.R. 1999a. Gold potential in Ball, Todd and Fairlie townships, Red Lake greenstone belt; *in* Summary of Field Work and Other Activities 1999, Ontario Geological Survey, Open File Report 6000, p.20-1 to 20-11.
- 1999b. Exploration potential for volcanogenic massive sulphide (VMS) mineralization in the Red Lake greenstone belt; *in* Summary of Field Work and Other Activities 1999, Ontario Geological Survey, Open File Report 6000, p.19-1 to 19-26.
- Percival, J.A., Breaks, F.W., Brown, J.L., Corkery, M.T., Devaney, J., Dube, B., McNicoll, V., Parker, J.R., Rogers, N., Sanborn-Barrie, M., Sasseville, C., Skulski, T., Stone, D., Stott, G.M., Syme, E.C., Thurston, P.C., Tomlinson, K.Y., and Whalen, J.B. 1999. Evolution of Archean continental and oceanic domains in the Western Superior Province: 1999 NATMAP Results; *in* Summary of Field Work and Other Activities 1999, Ontario Geological Survey, Open File Report 6000, p.17-1 to 17-16.

- Smith, S., Tindle, A.G., Kelley, S.P., and Breaks, F.W. 1999. Laser $^{40}\text{Ar}/^{39}\text{Ar}$ thermochronology of Archean rare-element pegmatites; Separation Lake belt and Berens River-Sachigo Subprovince Boundary, Northwestern Superior Province of Ontario; in *Summary of Field Work and Other Activities 1999*, Ontario Geological Survey, Open File Report 6000, p.29-1 to 29-12.
- Stone, D., Crawford, J. and Halstead, J. 1993. Precambrian geology, Kember Lake area; Ontario Geological Survey, Preliminary Map P.3220, scale 1:50 000.
- Stone, D., Fogal, R. and Fitzsimon, S. 1993. Precambrian geology, Favourable Lake area; Ontario Geological Survey, Preliminary Map P.3226, scale 1:50 000.
- Stone, D., Halle, J., and Lange, M. 1999. Geology of the Sherman River and Withers Lake areas, Northern Superior Province, Ontario; *in* *Summary of Field Work and Other Activities 1999*, Ontario Geological Survey, Open File Report 6000, p.22-1 to 22-7.
- Stott, G.M. and Corfu, F. 1991. Uchi Subprovince; *in* *Geology of Ontario*, Ontario Geological Survey, Special Volume 4, Part 1, p.145-236.
- Truscott, D.R. 1996. Hemlo Gold Mines Inc. 1996 report of work Shane Resources option – project 453 Superior District; Red Lake Resident Geologist's office, Ball Township, assessment file #91, 12p.





**Ontario Geological Survey
Regional Resident Geologist Program**

Red Lake Regional Resident Geologist (Kenora District)—1999

by

P. Hinz and C.C. Blackburn

2000

CONTENTS

Kenora District--1999

INTRODUCTION.....	1
MINING ACTIVITY	1
Dimension and Monument Stone	1
Nelson Granite Ltd. (a division of Granite Monuments Ltd.)	1
Cold Spring Granite Corp.....	3
Decorative Stone	3
Thorgrimson Stone Art Inc.	3
ADVANCED EXPLORATION AND DEVELOPMENT	3
EXPLORATION ACTIVITY	6
Platinum Group Metals.....	6
Champion Bear Resources Ltd.	6
Nuinsco Resources Ltd.	6
A. J. Raoul (OPAP)	7
Rare-metals.....	9
Avalon Ventures Ltd.	9
Emerald Fields Resource Corp.....	9
Gold.....	9
Consolidated Westview Resource Corp./Avalon Ventures Ltd.	9
LAND USE PLANNING ACTIVITY	9
RESIDENT GEOLOGIST PROGRAM STAFF AND ACTIVITIES	10
PROPERTY EXAMINATIONS	12
Denmark Lake Property	12
East Tweedsmuir Township Property.....	13
RECOMMENDATIONS FOR EXPLORATION	16
Mineralization Associated With Felsic Intrusive Bodies	16
New Geoscientific Data Dealing With The Kenora District	18
OGS ACTIVITIES AND RESEARCH BY OTHERS	19
ACKNOWLEDGEMENTS	21
REFERENCES.....	25

Tables

Table 1. Assessment files received in the Kenora District in 1999.....	4
Table 2. Exploration activity in the Kenora District in 1999.....	7
Table 3. Property visits conducted by the Kenora District Geologist in 1999.....	10
Table 4. Publications received by the Kenora District Office in 1999.	20
Table 5. Mineral deposits not being mined in the Kenora District in 1999.	21

Figures

Figure 1. Exploration activity in the Kenora District in 1999.	2
Figure 2. Kenora District, property visits and OGS field activities, 1999.	11
Figure 3. Location of the Denmark Lake property.	13
Figure 4. East Tweedsmuir Township Property, location map.	14
Figure 5. Recommendations for Exploration, Kenora District 1999.	19



RED LAKE REGIONAL RESIDENT GEOLOGIST (KENORA DISTRICT)--1999

P. Hinz¹ and C.C. Blackburn²

¹District Geologist, Kenora District, Resident Geologist Program, Ontario Geological Survey

²Acting District Support Geologist, Kenora District, Resident Geologist Program, Ontario Geological Survey

INTRODUCTION

Dimension, monument and decorative stone continued to be produced and marketed from six quarries in the Kenora District in 1999. No metallic mineral production was recorded in the District. Advanced exploration projects at Werner Lake (Canmine Resources Ltd.), Separation Rapids (Avalon Ventures Ltd. and Emerald Fields Resource Corp.) and Richardson Township (Nuinsco Resources Ltd.) were all worked during 1999. Other advanced exploration projects at Thunder Lake (Teck Exploration-Corona Gold Corporation), Shoal Lake (Royal Oak Mines) and Cameron Lake (Nuinsco Resources Ltd.) were inactive during 1999.

Exploration activity on Crown Land in the Kenora District during 1999 remained at a level similar to that recorded during 1998 (Table 2). Six projects, itemised in Table 2, were conducted with financial assistance from the Ontario Prospectors Assistance Program (OPAP), using 6 grants totalling \$90,000.

MINING ACTIVITY

There was no production of either base or precious metals in the Kenora District in 1999. Production continued from five granite quarries, and one soapstone quarry, with production from a new granite quarry initiated in 1999. The quarries are keyed, with letters in parentheses, to Figure 1.

Dimension and Monument Stone

Nelson Granite Ltd. (a division of Granite Monuments Ltd.)

Nelson Granite Ltd. continued year-round production from three stone quarries and started production on a fourth, in the Kenora District, during 1999. Production continued at the Docker Township quarry (A), 10 km southwest of the town of Vermilion Bay. Homogenous, medium-grained, pink granite is produced from a granite plug, which is part of the Dryberry batholith. Fracturing is negligible, allowing for removal of blocks of virtually any size. The majority of the stone produced is used in the monument industry and is sold as "Vermilion Pink". In 1999 approximately 7 080 m³ (250 000 cubic feet) were produced (N. Nelson, Nelson Granite Ltd., personal communication, 2000).

Nelson Granite Ltd. continued production at their Red Deer Lake quarry (B) in 1999. The quarry is located on the north shore of Red Deer Lake, approximately 40 km northeast of Kenora and 15 km northwest of the railway stop at Jones. A total of 1 415 m³ (50 000 cubic feet) were produced for use as monument and building stone (N. Nelson, Nelson Granite Ltd., personal communication, 2000). The stone is marketed as "Red Deer Brown" or "Canadian Mahogany" and was sold primarily to clients in North American markets. The stone is reddish-brown and is composed of pink, potassium feldspar phenocrysts in a fine- to medium-grained matrix of potassium and plagioclase

KENORA DISTRICT--1999

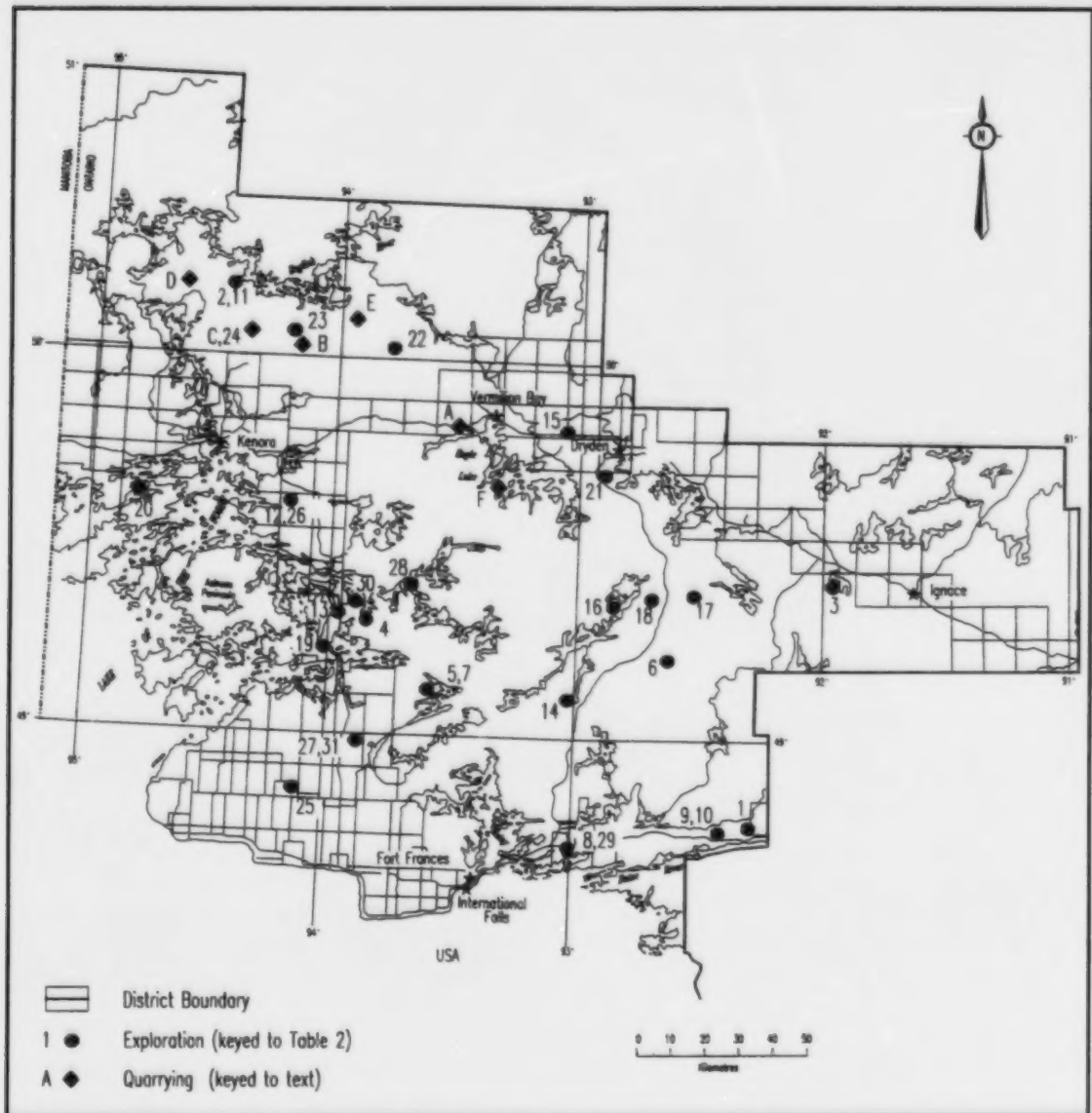


Figure 1. Exploration activity in the Kenora District in 1999.

feldspars, quartz and biotite. The granite formation is part of the Lount Lake batholith and is very massive with few, widely spaced fractures. Sheeting, or horizontal fracturing is spaced from 1 to 5 m and greater allowing for extraction of large blocks (Hinz, Landry and Gerow 1994).

Nelson Granite Ltd. continued to produce stone from their Forgotten Lake quarry (C) in 1999. The quarry is located on the east side of Forgotten Lake, approximately 35 km north of Kenora and 10 km north of the hamlet of Redditt. The quarry can produce two colours—a green megacrystic granite marketed as “Pine Green” and a yellow megacrystic granite sold as “Crystal Gold”. A combined total of 1 415 m³ (50 000 cubic feet) were produced and sold to North American markets (N. Nelson, Nelson Granite Ltd., personal communication, 2000). The stone is a

medium- to coarse-grained, porphyritic granite composed of yellow, potassic feldspar phenocrysts in a matrix of plagioclase, potassic feldspar, quartz and biotite. The granite, which is part of the Lount Lake batholith, is yellow at the surface and green at depth. The granite contains very few fractures; joints are spaced 2 to 3 m apart and sheeting is 1 to 2 m at the surface (Hinz, Landry and Gerow 1994).

Nelson Granite Ltd. started production at their Snook Lake quarry (D) in 1999. The quarry is located approximately 50 km northwest of Kenora and 23 km north of the hamlet of Minaki. A total of 283 m³ (10 000 cubic feet) were produced in 1999 for monumental stone use, under the market name "Canyon Red" (N. Nelson, Nelson Granite Ltd., personal communication, 2000). The stone is composed of pink and red, potassium feldspar phenocrysts in a matrix of potassium feldspar, quartz and biotite. (Hinz, Landry and Gerow 1994)

Cold Spring Granite Corp.

Cold Spring Granite Corp. continued production on their Havik Lake granite quarry (E) in 1999. The site is located approximately 34 km north-northeast of Kenora on the Jones Road. The quarry produced 1 405 m³ (49 600 cubic feet) of reddish brown, porphyritic granite which is sold under the name "Royal Auburn" (E. Charles, Cold Spring Granite Canada Ltd., personal communication, 2000). All production was shipped to the parent company in Cold Spring, Minnesota. The quarry is hosted in a massive granite body, which is part of the Lount Lake batholith. It contains very few vertical or horizontal fractures, which allows for the extraction of large blocks.

Decorative Stone

Thorgrimson Stone Art Inc.

In early 1999, Thorgrimson Stone Art Inc. removed approximately 200 tons of soapstone by ice road from their Eagle Lake quarry (F). The quarry is located on the southwest shore of Eagle Lake, approximately 38 km west-southwest of the city of Dryden. The soapstone is currently being sold for carving purposes to the Northwest and Nunavut territories, the United States and across Canada. The company has obtained a 21-year lease to ensure future production (P. Thorgrimson, Thorgrimson Stone Art, personal communication, 2000).

ADVANCED EXPLORATION AND DEVELOPMENT

In 1999, four properties in the Kenora District were at the advanced exploration stage: Avalon Ventures Ltd. (the Big Whopper rare-metal pegmatite); Canmine Resources Ltd. (the Werner Lake cobalt project); Emerald Fields Resource Corp. (the Big Mack rare-metal pegmatite); and Nuinsco Resources Ltd. (the #17 Gold zone). Only minor exploration work was conducted on the ground and is discussed in the Exploration Activity section. The projects were variously advanced through mill acquisitions (Canmine Resources Ltd.), road construction (Emerald Fields Resource Corp.), beneficiation and market testing (Avalon Ventures Ltd.) and financing (Nuinsco Resources Ltd.).

KENORA DISTRICT-1999

Table 1. Assessment files received in the Kenora District in 1999

Abbreviations	
AEM Airborne electromagnetic survey	Lc Linecutting
AM Airborne magnetic survey	Met Metallurgical testing
ARA Airborne radiometric survey	OD Overburden drilling
Beep Beep Mat survey	ODH Overburden drill hole(s)
Bulk Bulk sampling	OMIP Ontario Mineral Incentive Program
DD Diamond drilling	OPAP Ontario Prospectors Assistance Program
DDH Diamond drill hole(s)	PEM Pulse electromagnetic survey
DGP Down-hole geophysics	PGM Platinum group metals
GC Geochemical survey	Pr Prospecting
GEM Ground electromagnetic survey	RES Resistivity survey
GL Geological Survey	Samp Sampling (other than bulk)
GM Ground magnetic survey	Seismic Seismic survey
GPR Ground probing radar survey	SP Self-potential survey
GRA Ground radiometric survey	Str Stripping
Grav Gravity survey	Tr Trenching
HLEM Horizontal loop electromagnetic survey	UG Underground exploration/development
HM Heavy mineral sampling	VLEM Vertical loop electromagnetic survey
IM Industrial mineral testing and marketing	VLFEM Very low frequency electromagnetic survey
IP Induced polarization survey	

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Bennett Lake Area	Minescape Exploration Inc.	1997	EM, IP	2.18868	52C/16 SW BB-4
Bliss Lake Area	Stephana Resources	1997	EM, Mag	2.19141	52C/10 NW I-3
Boyer Lake Area	Newhawk Gold Mines Ltd.	1998	DD 7-663m	2.18765	52F/07 NE EEE-1
Boyer Lake Area	Newhawk Gold Mines Ltd.	1998	DD 4-421m	2.1896	52F/07 NE EEE-2
Brownridge Township	Corona Gold Corp.	1997	EM, Mag	2.18604	52F/15 SE EE-1
Code Township	Etherington, R.	1998	P, GL, SA	2.19115	52E/09 SE EE-2
Dash Lake Area	Barton, Bernard	1999	DD (3holes), S	2.19886	52F/04 SE R-1
Dogpaw Lake Area	Avalon Ventures Ltd.	1998	IP, Res	2.18852	52F/05 SW FFFF-4
Dogpaw Lake Area	Hornby Bay Exploration	1998	AEM, Amag	2.19074	52F/05 SW IIII-1
Dogpaw Lake Area	Starcore Resources	1998	IP	2.19225	52F/05 SW GGGG-2

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Dogpaw Lake Area	Twomey, Timothy	1997-98	GL, Mag, IP, Res	2.1934	52F/05 SW DDDD-5
Eagle Rock Lake Area	Champion Bear Resources	1999	DD	2.19780	52F/02 NE D-1
Fisher Lake Area	Barton, Bernard	1997-98	P, SA	2.19289	52F/12 SE I-7
Forgotten Lake Area	Nelson, Carter	1998	DD 5-5m	2.19288	52L/01 SW E-9
Forgotten Lake Area	Nelson, Carter	1999	DD	2.19839	52L/01 SW E-10
Garnet Bay Area	GRQ Mining Inc.	1998	GL, DD 2-8m, S	2.18524	52F/11 NW X-1
Haycock Township	President Mines Ltd.	1997	DD 2-156m, SA	2.18588	52E/09 NW SS-20
Ilsley Township	Sterlingmarc Mining Ltd.	1998	DD 4-326m	2.1839	52G/05 NW J-1
Kilgor Lake Area	Cold Spring Granite	1998	STr, DD, BS	2.19127	52K/04 SW D-2
Laval Township	Corona Gold Corp.	1996	P, Lc, GL, Geochem	2.1879	52F/16 SW GG-4
Le May Township	Pogson, G.	1999	Tr, STr	2.19521	52E/09 NE C-1
Menary Township	Glabraith, Melvin	1999	Tr, STr	2.19540	52C/13 NW O-1
Menary Township	Pogson, G.	1999	Tr, blasting	2.19521	52C/13 NW N-1
Menary Township	Pogson, G. and Fraser, L.	1999	P, Tr, STr	2.19513	52C/13 NW M-1
Paterson Lake Area	Avalon Ventures Ltd.	1997-98	GL, Tr, STr, SA, DA	2.19116	52L/07 SE R-2
Paterson Lake Area	Emerald Fields Resource Corp.	1997	STr, SA	2.19147	52L/07 SE S-1
Paterson Lake Area	Emerald Fields Resource Corp.	1998	GL	2.18854	52L/07 SE S-2
Revell Township	Fairservice, Robert	1999	Tr, Lc, SA	2.19720	52F/09 SE S-1
Roger Lake Area	Champion Bear Resources	1997	DD 1-108m	2.19136	52L/08 NW K-9
Zealand Township	Black Pearl Minerals Inc.	1998	Mag	2.18618	52F/15 SE DD-2

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Zealand Township	Teck Exploration Ltd.	1998	DD 1-101m, S	2.18808	52F/15 SE Y-11
Zealand Township	Twomey, Timothy	1998	STr, SA	2.19221	52F/15 SE CC-2

EXPLORATION ACTIVITY

A complete summary of exploration activity, including prospecting, is given in Table 2. Gold, rare-metal pegmatites and granite were the predominant targets in 1999. Described below are programs with significant exploration expenditures and/or known results. Where a number of commodities were targeted or discovered, projects are described according to the predominant commodity targeted. Base metal programs are not discussed because only small, grassroots programs were conducted, with no significant results reported. Exploration information included in this section is taken from assessment files in the Kenora District office, unless otherwise indicated. Programs are keyed with numbers in parentheses to Table 2 and Figure 1.

Platinum Group Metals

Champion Bear Resources Ltd.

Early in, 1999 Champion Bear Resources Ltd. signed an option agreement with prospector R. Fairservice, to acquire a 100% interest in the Eagle Rock platinum, palladium, gold, copper property (6). The property is located approximately 64 km due south of the city of Dryden, Ontario. The property consists of 12 original unpatented mining claims and an additional 16 claims, staked subsequently by the company, for a total of 1 650 hectares (Press release, Champion Bear Resources Ltd., March 11, 1999). The property was previously worked by Noranda Mines Ltd. from 1969 to 1974, when electromagnetic (EM), magnetic and induced polarization (IP) geophysical surveys were conducted, followed by 3 491 feet of diamond drilling in 10 holes. In 1986, BP Resources Canada Ltd. conducted reconnaissance work and found anomalous PGE values in samples taken from Noranda's abandoned drill core. An airborne gradiometer and EM geophysical survey was flown over the property in 1987, followed in 1988 by detailed geological mapping, sampling and a diamond-drill program. Work by these companies has outlined a mineralized zone over a strike length of 1 100 m, with drill widths from 4.0 to 51.0 m. The zone contains disseminated chalcopyrite, pyrite and magnetite, with sulphide content running from 1 to 10 percent and up to 15 percent locally (Press Release, Champion Bear Resources Ltd., March 11, 1999).

Following the closing of a private financial placement in May, Champion Bear initiated a diamond-drilling program in June. A total of 1 254 m of diamond drilling in 15 holes was completed. The program was intended to test the Campbell zone outlined by Noranda and BP. All 15 holes intersected the zone, confirmed the grades and expanded the thickness reported by the earlier work. Drill holes ER 1, 2, 4, 5 and 8 reported an average grade of 0.238 g/t Au, 0.239 g/t Pt, 0.473 g/t Pd, 3.8 g/t Ag, 0.43% Cu and 0.07% Ni, over an approximate true thickness of 25.0 m. Five holes tested the extreme west end of the Campbell zone and intersected an average width of 12.1 m grading 0.952 g/t combined Au/Pt/Pd, including a high grade core of 1.49 g/t combined Au/Pt/Pd over 4.6 m. The Campbell zone remains open at depth and to the southeast (Press Release, Champion Bear Resources Ltd., July 29, 1999). The company plans to follow-up on these results with a diamond-drilling program in early 2000.

Nuinsco Resources Ltd.

Nuinsco Resources Ltd. conducted a limited diamond-drilling program on the #34 nickel-copper-platinum group element (PGE) zone on their Rainy River Project (25). The program utilized large diameter drill holes in order to obtain samples for metallurgical testing and to obtain a reliable estimate of the tonnage and grade of the zone. Eight holes were drilled on the zone for a total 1 598 m. Sampling of five holes returned an average of 5.27 g/t Pd, 2.14

g/t Pt, 3.24 g/t Au, 15.22 g/t Ag, 1.37% Cu, 1.77% Ni and 0.096% Co (D. Hume, Nuinsco Resources Ltd., personal communication, 2000). The company anticipates additional work to be conducted during 2000.

A. J. Raoul (OPAP)

A.J. Raoul conducted an OPAP-assisted prospecting program over the Denmark Lake intrusion (28) and supracrustal rocks to the west, during the summer of 1999. This project was predicated on the recommendations published by the Kenora District Geologist in the 1998 Report of Activities, released in April, 1999. Prospecting, sampling and geophysical work was conducted on the western part of the property, to test a number of base metal targets. A reconnaissance sampling program was conducted over the gabbroic intrusion. During the summer of 2000 Raoul intends to conduct a detailed sampling program targeting the platinum potential of the Denmark Lake intrusion. A description of the property and its geology is provided in the Property Examinations section (below).

Table 2. Exploration activity in the Kenora District in 1999.

Abbreviations	
AEM Airborne electromagnetic survey	Lc Linecutting
AM Airborne magnetic survey	Met Metallurgical testing
ARA Airborne radiometric survey	OD Overburden drilling
Beep Beep Mat survey	ODH Overburden drill hole(s)
Bulk Bulk sampling	OMIP Ontario Mineral Incentive Program
DD Diamond drilling	OPAP Ontario Prospectors Assistance Program
DDH Diamond drill hole(s)	PEM Pulse electromagnetic survey
DGP Down-hole geophysics	PGM Platinum group metals
GC Geochemical survey	Pr Prospecting
GEM Ground electromagnetic survey	RES Resistivity survey
GL Geological Survey	Samp Sampling (other than bulk)
GM Ground magnetic survey	Seismic Seismic survey
GPR Ground probing radar survey	SP Self-potential survey
GRA Ground radiometric survey	Str Stripping
Grav Gravity survey	Tr Trenching
HLEM Horizontal loop electromagnetic survey	UG Underground exploration/development
HM Heavy mineral sampling	VLEM Vertical loop electromagnetic survey
IM Industrial mineral testing and marketing	VLFEM Very low frequency electromagnetic survey
IP Induced polarization survey	

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
1	Angove, Rick (Red Cedar Occurrence)	Bennett Lake Area (Au)	Pr, Str, Samp (OPAP)
2	Avalon Ventures Ltd. (Separation Rapids rare-metal property)	Paterson Lake Area (Li, Ta, Ce, Rb)	IM, Met
3	Avalon Ventures Ltd. (Raleigh Lake property)	Raleigh Lake Area (Ta, Li, Ce, Rb)	DD, GL, Samp
4	Avalon Ventures Ltd./Consolidated Westview Resources Ltd. (Dubenski property)	Dogpaw Lake Area (Au)	GM, IP
5	Barton, Bernard	Brooks Lake Area (Cu, Zn, Au)	Pr, DD, Samp

KENORA DISTRICT--1999

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
6	Champion Bear Resources (Eaglerock Lake property)	Eagle Rock Lake Area (Cu, Ni, PGE)	DD, GL
7	Chute, Michael	Dash Lake Area (Au)	Pr, GL, Samp (OPAP)
8	Cousineau, Louis, Cousineau, Ray & Desjardins, Ken (Redgut Bay Occurrence)	Halkirk Township (Cu, Ni, PGE)	Pr, Samp
9	Cousineau, Louis, Cousineau, Ray & Desjardins, Ken (Sutherland Occurrence)	Bennett Lake Area (Au)	Pr, Samp
10	Cousineau, Louis, Cousineau, Ray & Desjardins, Ken (Twin Pines Occurrence)	Bennett Lake Area (Au)	Pr, Samp, Tr
11	Emerald Fields Resource Corp. (Separation Rapids rare-metal property)	Paterson Lake Area (Li, Ta, Ce, Rb)	Met, IM
12	Etherington, Robert	Code Township (Au)	Pr, Samp
13	Fenwick, Kenneth G.	Tweedsmuir Township (Au)	Pr, Samp (OPAP)
14	Fratton, Chris (Smoothrock Lake Occurrence)	Sakwite Lake Area (Au)	GL, Pr, Str, Samp (OPAP)
15	Glatz, Alex (AL91 & 92 property)	Van Horne Township (Au)	Pr, Str, Tr, Samp
16	Glatz, Alex (Reliance Mine)	Lower Manitou Lake Area (Au)	Pr, Str, Samp
17	Goldeye Explorations Limited (Pelham Showing)	Boyer Lake Area (Au)	GL, IP, Pr
18	Goldeye Explorations Limited (Sunshine Lake project)	Boyer Lake and Meggisi Lake areas (Au)	IP, Pr
19	Harvey, Craig	Phillips Township (Au)	Pr, Samp, GL, GM (OPAP)
20	Johnson, Sherridon and Bond II, James	Echo Bay Area (Au)	Pr, Samp
21	Kozowy, Alex	Contact Bay Area (Au)	Str, Samp
22	Nelson Granite Ltd. (Kilgor Lake Site)	Kilgor Lake Area (Stone)	DD, GPR
23	Nelson Granite Ltd. (Shepody Quarry)	Wonderland Lake Area (Stone)	Bulk, GPR, IM
24	Nelson Granite Ltd. (Forgotten Lake Quarry)	Forgotten Lake Area (Stone)	DD, Str, GPR
25	Nuinsco Resources Ltd. (Rainy River Project)	Richardson Township (Cu, Ni, PGE)	DD
26	Pogson, Gordon (Lavender Lake property)	Code Township (Au)	Pr, Str, Samp
27	Pogson, Gordon (Menary Township property)	Menary Township (Au)	Pr, Str, Samp
28	Raoul, Alan (Denmark Lake Property)	Atikwa Lake Area (Cu, Zn, Ni, PGE)	Pr, Lc, GEM, GM, GL, Samp
29	Royer, Guy	Halkirk Township (BM)	Pr, Samp (OPAP)
30	Starcore Resources Ltd. (Dogpaw Property)	Dogpaw Lake Area (Au)	GC
31	Western Troy Capital (Wagg Occurrence)	Menary Township (Au)	IP

OPAP - Ontario Prospectors Assistance Program

Rare-metals

Avalon Ventures Ltd.

Avalon Ventures Ltd. continued exploration and development work on their Separation Rapids rare-metal property, host to the Big Whopper Pegmatite (2), located approximately 60 km north of Kenora. In early 1998 Avalon announced a preliminary resource calculation of the petalite zone of at least 7 081 700 tonnes grading 1.285% Li_2O (lithium oxide) and 0.346% Rb_2O (rubidium oxide) over a strike-length of 600 m and to a maximum depth of 250 m. In 1999 Avalon Ventures conducted a modest exploration program on the property consisting of lithogeochemical sampling, geological mapping and sampling.

Emerald Fields Resource Corp.

Emerald Fields Resource Corp. continued work on their Big Mack rare-metal pegmatite in the Separation Rapids area (11). The property is west of and adjacent to the Big Whopper Pegmatite held by Avalon Ventures Ltd. Work in 1998 identified a series of large highly fractionated, rare-metal pegmatites containing sections of up to 100% petalite. Sections of drill core assayed over 2.5% Li_2O and surface samples contained elevated cesium and rubidium values. Small amounts of the minerals wodginite and tantalite, both tantalum-bearing oxides, were also identified (Hinz and Ravnaas 1999 in Blackburn et al.). In 1999 Emerald Fields conducted geological mapping and sampling. Work progressed on the construction of a 9 km access road to reduce road travel by approximately 37 km.

Gold

Due to weak gold prices during 1999, few significant exploration projects targeting gold were conducted in the Kenora District. A number of small company projects were run and individual prospectors continued to explore for gold, some supported by the Ontario Prospectors Assistance Program (OPAP). The companies and individuals conducting work are listed in Table 2.

Consolidated Westview Resource Corp./Avalon Ventures Ltd.

Consolidated Westview Resource Corp. and joint-venture partner Avalon Ventures Ltd. conducted a limited exploration program on their Dubenski Gold Project (4). The Dubenski property hosts the Shaft zone deposit, which has a drill-indicated resource of 355 286 tonnes grading 6.36 g/t Au, calculated to a depth of 150 m (press release, Avalon Ventures Ltd. and Consolidated Westview Resource Corp., November 18, 1998). The mineralization is hosted within a 91 m wide, quartz-sericite-pyrite schist, with free gold visible along foliation planes. The Shaft zone is contained within the Flint Lake shear, a splay off of the larger Pipestone-Manitou fault, which is a through-going fault system (Blackburn and Hinz 1995).

Field work included a ground magnetometer and IP geophysical surveys on the East Cedartree zone, diamond-drilled in 1998 (press release, Consolidated Westview Resource Corp. and Avalon Ventures Ltd., February 17, 1999). Consolidated Westview was unable to raise sufficient capital to continue work on the property and returned the property to Avalon Ventures in late 1999.

LAND USE PLANNING ACTIVITY

Staff in the Kenora District participated in a number of *Ontario Living Legacy* initiatives, including providing mineral resource assessments of designated sites within the District. A review of designated sites and the impact on the existing mining lands fabric was completed.

RESIDENT GEOLOGIST PROGRAM STAFF AND ACTIVITIES

The Kenora office was staffed by: P. Hinz, District Geologist; C.B. Ravnaas, District Support Geologist; C.C. Blackburn, Acting District Support Geologist; R. Tuesday and R. Weiss, summer assistants.

P. Hinz and C.B. Ravnaas attended the Prospectors and Developers of Canada Convention in Toronto, in March, staffing the Northwestern Ontario regional display. A poster and talk highlighting activities in the district and providing recommendations to prospectors was presented at the Northwestern Ontario Mines and Minerals Symposium held in Thunder Bay in April. F. Hinz attended the Institute on Lake Superior Geology in Marquette, Michigan in May. P. Hinz and C.B. Ravnaas attended the Minnesota Exploration Conference in Tower, Minnesota. P. Hinz also attended the Manitoba Mining and Minerals Convention held in Winnipeg, Manitoba in November.

In 1999, staff of the Kenora District office (Table 3, Figure 2) conducted a total of 24 property visits.

Table 3. Property visits conducted by the Kenora District Geologist in 1999.

Number (keyed to Figure 2)	Property/Occurrence
1	Barton, B. - Phinney Lake property
2	Chute, M. - Dash Lake property (OPAP)
3	Cousineau, L., Cousineau, R. and Desjardins, K. - Sutherland shaft
4	Cousineau, L., Cousineau, R. and Desjardins, K. - Twin Pines occurrence
5	Fenwick, K.G. - East Tweedsmuir Township property (OPAP)
6	Fratton, C. - Smoothrock Lake occurrence (OPAP)
7	Glatz, A. - AL 91 & 92 occurrence
8	Glatz, A. - Reliance Mine
9	Grave Lake PGE reconnaissance
10	Harvey, C. - Phillips Township property (OPAP)
11	Johnson, S. and Bond II, J. - Echo Bay adit
12	Kostick, W. - Unnamed occurrence
13	Kozowy, A. - Flambeau Lake property
14	Nelson Granite - Forgotten Lake Quarry
15	Nelson Granite - Shepody site
16	Pogson, G. - Lavender Lake property
17	Pogson, G. - Menary Township property
18	Raoul, A. - Denmark Lake property (OPAP)
19	Querel, R. - Penner Pit
20	Staff Reconnaissance - Bonanza Mine (MDI)
21	Staff Reconnaissance - Keewatin Mine (MDI)
22	Staff Reconnaissance - Redeemer Mine (MDI)
23	Staff Reconnaissance - Sultana Mine (MDI)
24	Western Troy Capital - Wagg Prospect

MDI - Mineral Deposits Inventory, field visit

OPAP - Ontario Prospectors Assistance Program

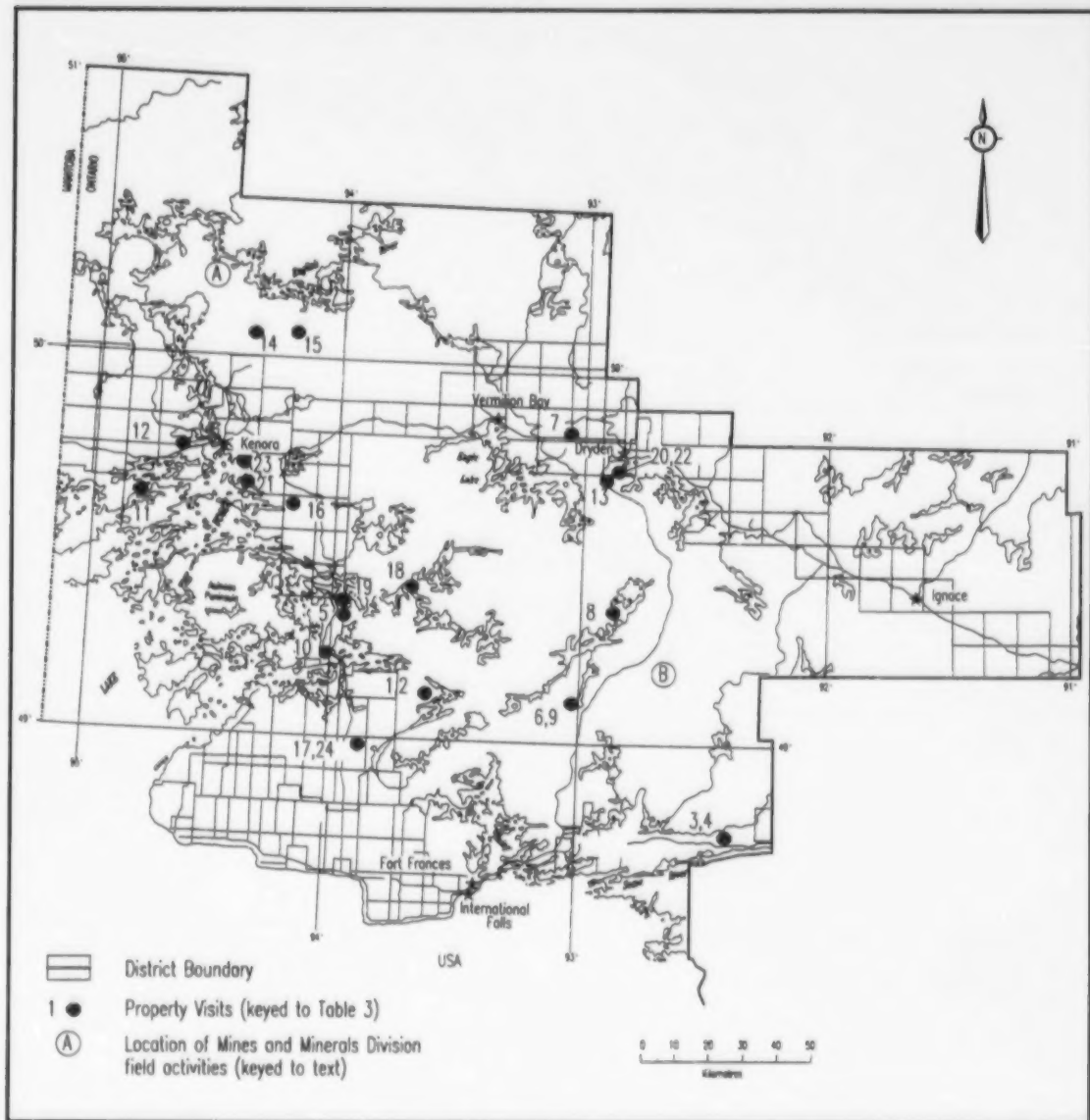


Figure 2. Kenora District, property visits and OGS field activities, 1999.

PROPERTY EXAMINATIONS

The following property examinations are authored by P. Hinz.

Denmark Lake Property

The Denmark Lake property is located approximately 30 km east of the town of Sioux Narrows (Figure 3). The property is accessed by truck, via the Maybrun Road, which departs Highway 71 to the east, or by boat via Lobstick Bay of Lake of the Woods. Travel on Denmark Lake is facilitated by boat from Caribou Lodge. All outcrops on this property visit were accessed by boat.

Exploration of the Denmark Lake area dates back to the late 1930s with the discovery of nickeliferous sulphides in the vicinity of Empire Lake, which led to the development of the Kenbridge Deposit (Table 5). The main period of exploration was in the 1950s, when over 20 properties were examined for their copper-nickel potential. Only sporadic exploration has occurred since that time. The current property hosts a number of occurrences noted in the geological report on the Atikwa Lake area by Davies (1973), including: the North Shore Showing (copper); the Base Line Showing (copper); the Number 1 Showing (copper-nickel); the Ross Creek Showing (copper-nickel); and the Denmark Lake Showing (copper-nickel).

M. Hailstone conducted sampling of the mafic intrusions in the Denmark Lake-Atikwa Lake area, as part of a platinum group element evaluation of the Kenora District in the late 1980s (Hailstone *in* Blackburn et al. 1989). Hailstone obtained anomalous values up to 180 ppb platinum and 71 ppb palladium from samples of the Denmark Lake Intrusion. Hinz and Ravnaas (Hinz and Ravnaas *in* Blackburn et al. 1999) recommended a number of intrusions surrounding the Atikwa-Lawrence Lake batholith, including the Denmark Lake intrusion, be examined for their copper-nickel-PGE potential. A.J. Raoul followed-up on Hinz and Ravnaas' 1999 recommendations and conducted an OPAP-assisted exploration program on the Denmark Lake intrusion and supracrustal rocks to the west.

The Denmark Lake intrusion is situated in the western Wabigoon subprovince, part of the Superior Province. A portion of the property is underlain by supracrustal rocks of the Kakagi-Rowan lakes greenstone belt. The supracrustal rocks are primarily mafic metavolcanic rocks of the Rowan Lake volcanic group. The Denmark Lake intrusion is composed of gabbro and norite. These mafic intrusive rocks are not well understood. There has been little petrochemical work done on these rocks and it is not currently known whether they are syn- or post-volcanic.

Property geology compiled by A.J. Raoul indicates that the west end of the property is underlain by massive, mafic metavolcanic rocks with lesser pillowed and brecciated units. Thin units of felsic metavolcanic rocks are intercalated with the mafic flows. The mafic units host a number of copper occurrences similar to the copper-gold Maybrun Mine, 5 km to the north. The central part of the property is underlain by the Denmark Lake intrusion. The intrusion, as described by Hailstone (*in* Blackburn et al. 1989), is a polyphase intrusion consisting of peridotite, gabbro, diorite, quartz diorite and granodiorite. Several copper-nickel occurrences are hosted by this intrusion, on the property. Work conducted by Raoul included line-cutting, prospecting and sampling of the whole property, geological mapping and a ground electromagnetic and magnetic survey of the western supracrustal rocks.

Outcrops visited by the author contained vari-textured gabbro, fine- to coarse-grained gabbro and lesser mafic metavolcanic rafts and felsic dikes. The first trench visited contained up to 5% sulphides consisting of pyrite and chalcopyrite. A sample of mineralized gabbro, collected at this site by the author, returned 52 ppb gold, 191 ppb platinum, 107 ppb palladium, 3510 ppm (0.35%) copper and 1816 ppm (0.18%) nickel. This trench covers one of a series of IP anomalies identified by Huston and Associates (Kenora Assessment Files, 52F/05SE K-1). Two samples collected by Raoul assayed 255 ppb platinum and 124 ppb palladium, and 171 ppb platinum and 81 ppb palladium respectively. A second trench, 30m inland from the first, contained heavily weathered gabbro with malachite and azurite staining. Coarse-grained biotite was observed within the gabbro, suggesting that the crystallizing fluids were hydrous, favourable for copper-nickel-PGE mineralization. However, a sample collected by the author failed to return significant values, however. Mineralization observed was primarily finely

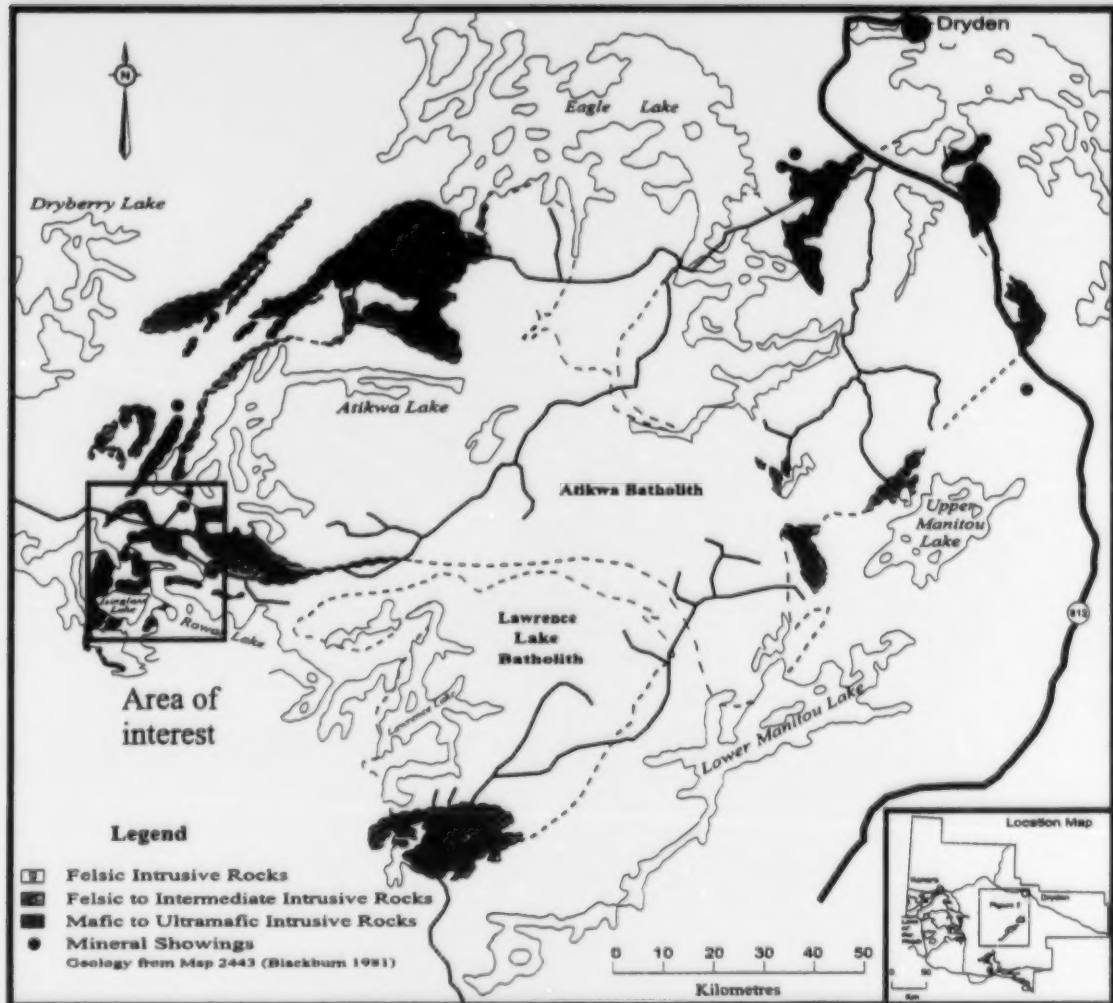


Figure 3. Location of the Denmark Lake property.

disseminated pyrite and chalcopyrite. It was difficult to determine if the sulphides were interstitial to the silicate minerals.

The anomalous values, presence of vari-textured gabbro and the hydrous nature of the mafic intrusion suggest that further exploration of the Denmark Lake intrusion is warranted.

East Tweedsmuir Township Property

The East Tweedsmuir Township property (Figure 4) was visited by the Kenora District Geologist in September, 1999. The property is held by K.G. Fenwick of Thunder Bay, Ontario and J.E. Bond II of Welch, West Virginia. The property consists of 5 staked mining claims (1220873, 1220879, 1220881, 1231818 and 1232781) located approximately 12 km due south of Sioux Narrows. Highway 71 traverses the length of the property from the

KENORA DISTRICT--1999

southwest to the northeast. Outcrops along the highway and on the Cameron Lake Road were examined and sampled by the author.

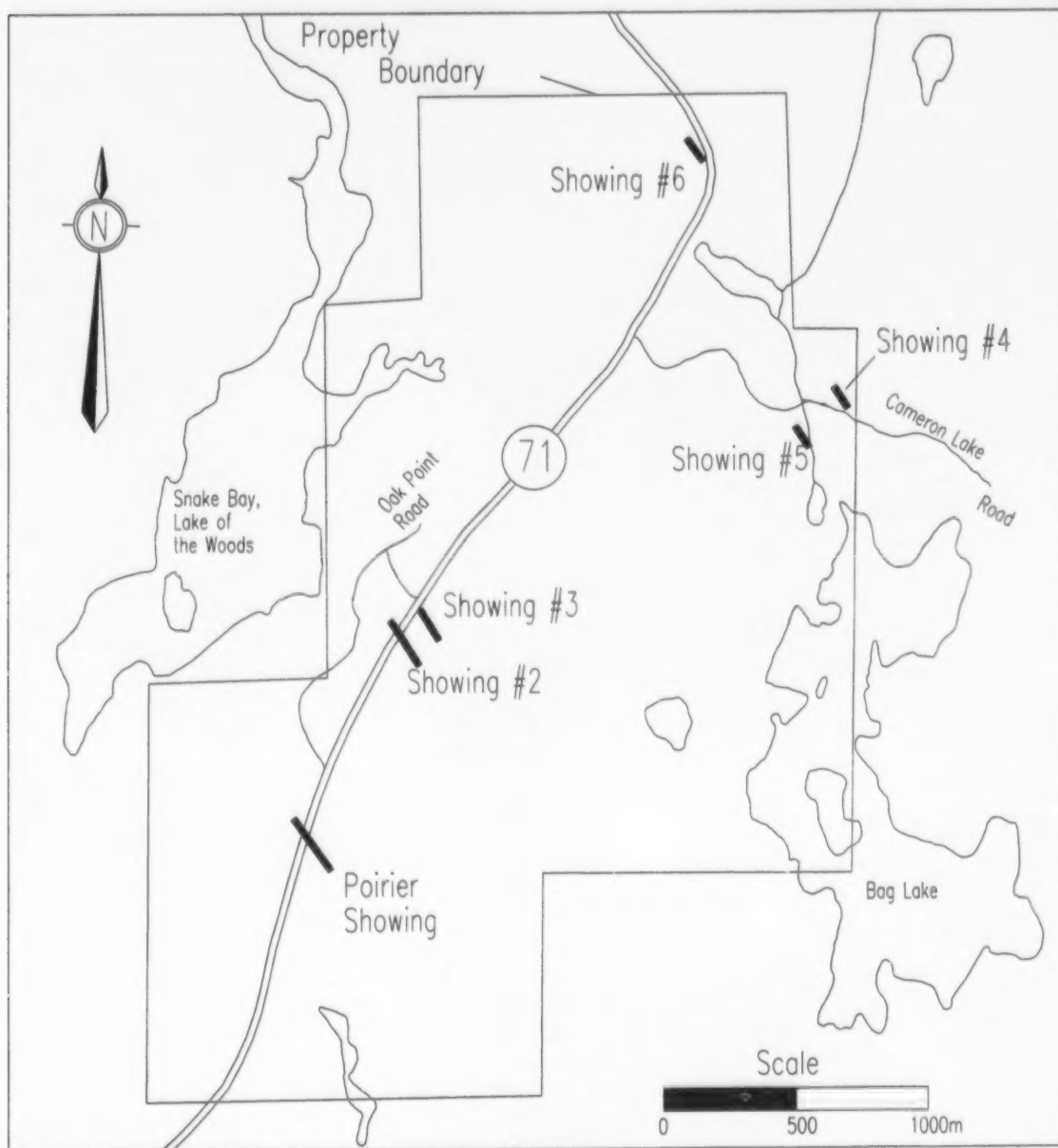


Figure 4. East Tweedsmuir Township Property, location map.

The property is underlain by supracrustal rocks of the Kakagi-Rowan Lake greenstone belt, in the western Wabigoon Subprovince, which is part of the Superior Province. Mapping by Davies and Morin (1976) indicates the major lithologies to be mafic to intermediate flow rocks, with gabbroic equivalents and quartz porphyry dikes. The Pipestone-Manitou fault traverses the area to the northeast, with many splays occurring on both the north and south sides. These splays have several mineralized zones associated with them, such as Nuinsco Resources Cameron Lake deposit, Avalon Ventures Dubenski Shaft zone and the Canadian Arrow deposit. Many of the occurrences in the area are shear hosted with associated carbonate/ankerite alteration.

The property hosts two known mineral occurrences, the Poirier occurrence and the Jenson-Johnston occurrence. The Poirier occurrence was discovered in 1943 and optioned to Sylvanite Gold Mines Ltd. Since that time, during the 1980s, only two other companies conducted work over the property. Beard and Garratt (1976) report a mineralized zone 10 to 18 ft in width, with a strike-length of 2 000 ft. Sylvanite obtained assays up to 4.22 g/t Au over 4.9 m. The Jenson-Johnston was discovered in 1960 and subsequently optioned to Selco Exploration Company. In 1987, Granges Exploration Ltd. conducted an exploration program consisting of ground geophysical surveys and diamond drilling. K.G. Fenwick and J.E. Bond II staked the ground in 1998 and 1999. A prospecting and sampling program, funded by two OPAP grants was conducted during 1998 and 1999. Fenwick located the Poirier occurrence and several other previously undocumented mineral occurrences, showings #2, #3, #4, #5 and #6.

A series of outcrops along Highway 71 were visited by the author and are reported here. The Poirier showing is hosted in sheared and altered andesite. Moderate to intense carbonate alteration is seen as a bleaching of the host rock. The alteration is 3.0 to 3.5 m wide and is associated with a discrete shear 0.5 to 0.7 m wide, striking 161° and dipping 80° to the east. Sulphide mineralization is primarily disseminated pyrite throughout the alteration zone up to 2% and locally up to 5% as pods. Randomly oriented quartz-ankerite veinlets are evident throughout the alteration zone. Locally sericite is developed along slip faces within the shear. A trench on the west side of the highway contains a highly siliceous unit approximately 0.2 m wide and is carbonatized. A sample collected by the author returned 0.02 ounce per ton gold. Other samples collected at this site returned anomalous copper, nickel and zinc values but no additional gold.

Showing #2 is located north approximately 800 m and is hosted by a breccia zone in massive flows. Quartz flooding is evident with minor ankerite alteration. Up to 2% pyrite is present within the brecciated unit. A sample collected here by the author assayed 0.03 ounce per ton gold. Alteration at this location was not as penetrative as at the Poirier. Samples collected by K.G. Fenwick assayed 807, 970, 992 and 2 672 ppb gold respectively.

Showing #3 is located approximately 80 m north of Showing #2. Here, the shearing and alteration is less noticeable within the intermediate metavolcanic rocks. Samples collected by the author yielded anomalous nickel and zinc values, but no gold or copper. Two samples collected by K.G. Fenwick assayed 3 240 and 6 248 ppb gold.

The Jenson-Johnston Occurrence is located near the Cameron Lake Road, just west of Bag Creek. At the time of this property visit, the occurrence had not been located by Fenwick. However, a series of small, rubble-covered outcrops just east of Bag Creek, Showing #4, were examined. The rocks are strongly foliated, carbonatized and weathered, making identification difficult. It appears that mafic metavolcanic rocks are intruded by quartz-phyrlic porphyry dikes. Grab samples were collected and sent for analysis. One sample was silicified and carbonatized to a point that a definite rock type could not be determined; it assayed 0.01 ounce per ton gold. A second sample of mafic metavolcanic rock returned anomalous copper and zinc values but no gold. Fenwick located the Jenson-Johnston occurrence shortly after the author's visit. Two samples assayed 466 and 7 215 ppb gold.

The East Tweedsmuir Township property hosts shear-associated mineralization which is common throughout the Dogpaw Lake area. The occurrences on the property and others in the vicinity should be examined for their potential to host economic gold mineralization.

RECOMMENDATIONS FOR EXPLORATION

Mineralization Associated With Felsic Intrusive Bodies

Located within the Kenora District are a number of porphyritic, felsic intrusive bodies (Figure 5), all within the Wabigoon subprovince, which may have the potential to host economic deposits of gold and copper. Some of these bodies (e.g. the High Lake stock and Thundercloud porphyry) have received a significant amount of exploration and academic investigations over the years, while several others have not (e.g. the Phinney and Dash Lakes stock, Esos Lake stock, Stephen Lake stock, and Sunshine porphyry). Porphyry bodies located at High Lake and Washeibemaga Lake (i.e. the Thundercloud porphyry) are known to host significant occurrences of gold and copper, with the High Lake stock hosting calculated reserves of gold, copper and molybdenum. In the 1970s and 1980s, OGS staff (Colvine and Sutherland 1979, Colvine and Marmont 1981, Smith 1987) examined early Precambrian porphyry deposits throughout Ontario. While some bodies, including the High Lake stock, displayed characteristics similar to Mesozoic porphyry copper deposits, none could be considered as equivalents of these more recent porphyry deposits (Colvine and Marmont, 1981).

The High Lake area (1) is located approximately 45 km due west of the City of Kenora. The High Lake stock lies within the Lake of the Woods greenstone belt (Blackburn et al. 1991). As a result of work in the High Lake area, Davies (1965) suggested a possible porphyry association for the copper and molybdenum occurrences. While metal zonation and wide-spread alteration are evident, Pedora (1976) considered it doubtful that the mineralization in the area had a porphyry-copper origin. Smith (1987) noted that much of the gold and some of the molybdenite mineralization was hosted within D₂ shears that post-date the cooling of the eastern phase of the stock. Smith suggests that the western phase, which post-dates the D₂ event, may have acted as a heat engine to re-mobilize gold and sulphide mineralization into the shears. Although the origin of the mineralization is not well known, the exploration potential is quite high. Associated with the High Lake stock are: three deposits with calculated reserves totalling 356 000 tons, with an average grade of 0.265 ounce per ton gold; one deposit with 126 000 tons grading 0.015 ounce per ton gold and 0.68% molybdenum; and four prospects hosting mineralization with significant widths and strike-length. The reader is referred to Table 5, for more details. All deposits in NTS area 52E/11NE are associated with the High Lake stock.

The Thundercloud porphyry (2) is located approximately 48 km south-southeast of the City of Dryden. The porphyry lies within the Eagle-Wabigoon-Manitou Lakes greenstone belt (Blackburn et al. 1991). As a result of detailed mapping, Blackburn (1981) interpreted the Thundercloud porphyry to be a sub-volcanic feeder to the overlying felsic volcanic sequence. Known gold occurrences associated with the Thundercloud porphyry include the Pelham prospect, the Armstrong occurrence, and the Renders or Patterson occurrence. The geology of the Pelham prospect has been described by Blackburn (1981). Parker in Blackburn et al. (1989) describes the mineralization and mode of occurrence of all the occurrences associated with the Thundercloud porphyry. Gold mineralization occurs to the north of the porphyry, within metavolcanic rocks of the Wapageisi Lake Group, and is associated with sulphides in siliceous, biotitized and epidotized zones of hydro-fracturing (Parker, Blackburn and Perrault, 1988). The mineralization was deposited in synvolcanic structures in the upper portion of the Wapageisi Lake Group by hydrothermal fluids associated with the Thundercloud porphyry, and in zones of hydro-fracturing adjacent to the porphyry. Samples collected by Parker at the Pelham Prospect returned assays between 17 ppb and 0.102 ounce per ton gold.

While the geological parameters of the High Lake and Thundercloud Lake porphyries are well known, resulting in extensive exploration, there are several felsic intrusive bodies within the Kenora District which are not as well known or explored. The Phinney and Dash lakes stocks, Esos Lake stock, Stephen Lake stock, and Sunshine porphyry are all worthy of examination. These felsic intrusions will be discussed in the following paragraphs.

The Sunshine porphyry (3) (NTS 52 F/07NE) is located within the Eagle-Wabigoon-Manitou Lakes greenstone belt (Blackburn et al. 1991). The Sunshine porphyry has been described by Blackburn (1981, 1982) as a sub-volcanic intrusion. Petrochemical work by Blackburn (1982) indicated that rhyolitic flows north of Sunshine Lake and felsic

flows in the Cane Lake formation to the southwest are probably the eruptive phase of the sub-volcanic intrusion. At present, there are no documented mineral occurrences related to the Sunshine porphyry. However, in 1996, work by Black Pearl Minerals Inc. for B. Webster (Kenora Assessment Files, 52F/07SE B-5), identified several "high priority" drill targets, within the surrounding volcanic rocks. These were based on the following criteria, elevated to anomalous gold and base metal values and favourable alteration.

The Esos Lake stock (4) (NTS 52 F/03SE & SW) is located at the junction of the Kakagi-Rowan Lakes, Eagle-Wabigoon-Manitou Lakes and Otukamamoan Lake greenstone belts (Blackburn et al. 1991). The stock is situated south of the Pipestone-Manitou fault, which is a through-going fault system (Blackburn and Hinz 1995). Edwards (1983b) and Smith (1993) mapped portions of the Esos Lake stock. Edwards (1983b) identified two porphyry bodies in the vicinity of Esos Lake. The northern porphyry is noted to be highly fragmented, while the southern body is partially to completely brecciated. Edwards suggests the structure of the body to be autoclastic, a result of autobrecciation during intrusion. Smith (1993), however, suggests the porphyry to be a subvolcanic dome. Neither Edwards (1983b) nor Smith (1993) analysed the Esos Lake stock or adjacent units for gold or base metal content. Likewise, there has been no exploration conducted on the porphyry itself. There has been limited exploration targeting the volcanic and sedimentary rocks to the north and northwest of the Esos Lake stock.

The Phinney and Dash lakes stocks (5) (NTS 52 F/04SE) are part of the Kakagi-Rowan Lakes greenstone belt. The complex is described by Edwards (1980, 1983a) as a syn-volcanic porphyry intrusion with extrusive equivalents. Edwards (1983a) proposes that a rising felsic magma intruded its own extrusive products in a submarine environment. Exploration has been conducted in the area for both gold and base metal commodities. Freeport Canadian Exploration Company conducted an airborne geophysical electromagnetic survey over the area in 1971 and 1972. This was followed up by diamond drilling on two targets. A mineralized intersection assayed 0.18% copper and 0.25% zinc over separate one foot intersections on a target southwest of Phinney Lake (Kenora Assessment Files, 52 F/04SE C-3). Trenching was conducted by Lloydex Resources Inc. in 1984 on the east shore of Phinney Lake. Semi-massive to massive sulphides yielded assays up to 2 200 ppm copper, 106 ppm zinc and 0.004 ounce per ton gold. Samples analysed for gold returned assays from trace values up to 274 ppb (Kenora Assessment Files, 52 F/04SE I-1). From 1993 to 1996 Phelps Dodge Corporation of Canada, Limited conducted airborne and ground geophysical surveys followed by geological mapping and diamond drilling. Work by Phelps Dodge identified two areas containing anomalous copper and zinc values along with hydrothermal alteration (Kenora Assessment Files, 52 F/04SE Q-5). No significant gold values were intersected. Commencing in 1998, with funding from OPAP, prospector/geologist M. Chute has conducted a prospecting and sampling program around Dash Lake. While Edwards (1980) identified the intrusive rocks as a trondhjemitic felsic porphyry, Mr. Chute believes them to be quartz-feldspar porphyry. Prospecting and sampling by M. Chute have yielded gold values up to 1 250 ppb gold (M. Chute, prospector, personal communication, 1999). A sample collected by the author, of silicified quartz-feldspar porphyry containing up to 3 percent disseminated pyrite, assayed 0.03 ounce per ton gold. The presence of anomalous gold, copper and zinc values and hydrothermal alteration within the Phinney and Dash lakes stocks suggests that further investigation for gold and base metals is warranted.

The Stephen Lake stock (6) (52 F/05SW) lies within the Kakagi-Rowan Lakes greenstone belt. The stock was mapped by Davies and Morin (1976) as a late felsic intrusive body with a composition ranging from quartz diorite to augite diorite. Davies and Morin (1976) state that "the nature of the intrusion suggests that it is similar to the "porphyry copper" type intrusions in the western part of the North American continent, i.e. an epizonal, intermediate composition pluton with porphyritic phases, a high degree of mineral alteration, finer grained borders and associated economic mineralization." During field mapping Davies and Morin (1976) noted the presence of molybdenum, gold and sulphide mineralization, as well as extensive alteration of portions of the stock. The associated mineralization and nature of the alteration should be investigated further.

Each of the felsic intrusions discussed have associated mineralization and alteration which merit additional exploration. There is potential for gold mineralization to be hosted within the intrusions and in zones of deformation in the overlying volcanic rocks. Potential base metal mineralization and zones of hydrothermal alteration within the volcanic pile above the intrusions should be investigated. While evidence for economic Precambrian porphyry deposits is sparse, the possibility should not be overlooked, in particular in the High Lake and Stephen Lake stocks.

New Geoscientific Data Dealing With The Kenora District

In early 2000, several Ontario Geological Survey publications dealing with the geology of portions of the Kenora District, were released. These reports are: Geological Report 266, Archean Metallogeny of the Mine Centre-Fort Frances Area, by K. H. Poulsen; Mineral Deposits Circular 29, Geological Setting of Mineralization in the Mine Centre-Fort Frances area, by K.H. Poulsen; and Open File Report 6001, Precambrian Geology of the Separation Lake Area, Northwestern Ontario by C.E. Blackburn and J.B. Young. The areas contained within these reports are outlined in Figure 5.

The first two reports by K.H. Poulsen deal with the geological, metallogenic and structural nature of the supracrustal rocks in the Mine Centre-Fort Frances area (A). In Geological Report 266, Poulsen provides insight into the structural complexities of the area, bounded on the north by the Quetico fault and on the south by the Seine River fault. Discussions of the main mineral deposit types, tectonics and metallogeny are also included. Mineral Deposits Circular 29 includes a summary of information discussed in detail in Geological Report 266 and provides over 80 individual property descriptions. Both of these reports are invaluable sources of information for explorationists conducting work in the Mine Centre-Fort Frances area.

Field work by Blackburn and Young in 1992 and 1993 in the Separation Lake area resulted in the production of Open File Report 6001 (B). Prior to this only reconnaissance mapping (1:63 360) (Breaks et al. 1975a, 1975b) had been conducted as part of a helicopter-supported regional-mapping program between 1972 and 1975. Sporadic exploration had occurred in the area since the discovery of gold by A. Gauthier in the 1940's. Gold, iron, uranium, graphite and base metals all had been exploration targets prior to Blackburn and Young's mapping program. During the program, a number of beryl occurrences were identified, which predicated field work by F. Breaks of the OGS. Subsequent field work by Breaks and others (e.g. Breaks and Tindle 1997) identified the Separation Lake pegmatite field and ultimately the Big Whopper rare-metal pegmatite currently being developed by Avalon Ventures Limited, and to the discovery of the Big Mack rare-metal pegmatite, adjacent to the Big Whopper, being developed by Emerald Fields Resource Corporation. The report by Blackburn and Young suggests the rare-metal pegmatite bearing field may be larger than currently known. The authors make note of the significant base metal potential of the greenstone belt. Assay data presented suggest that there is also potential for base metals within migmatites external to the greenstone belt, particularly in the eastern portion of the map area. The potential for base metal, rare-metal pegmatite, graphite mineralization and building stone deposits make this area an ideal target for explorationists.

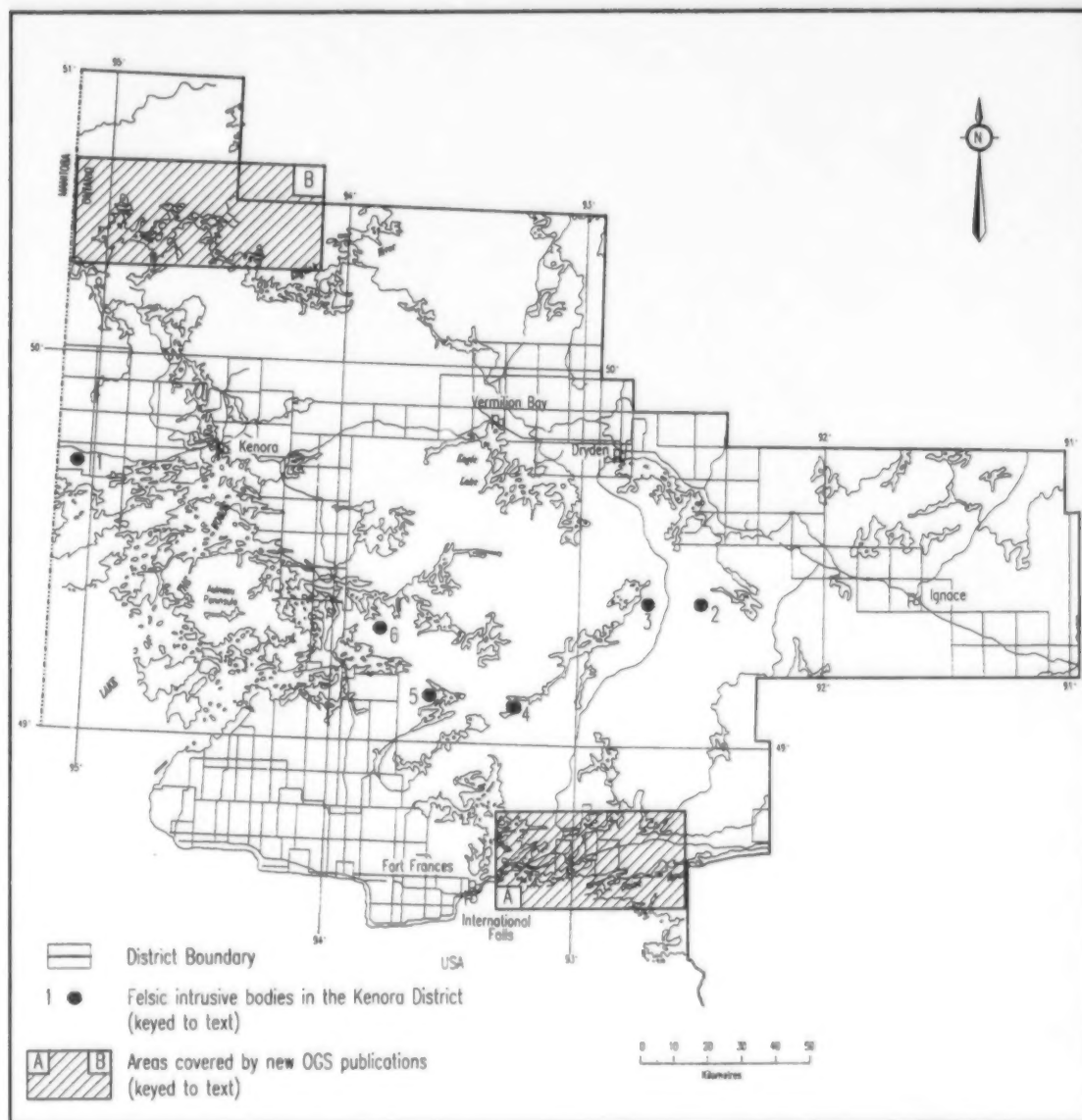


Figure 5. Recommendations for Exploration, Kenora District 1999.

OGS ACTIVITIES AND RESEARCH BY OTHERS

Two Ontario Geological Survey field projects were conducted in the Kenora District in 1999. For the location of the 2 projects see Figure 2.

- A) F. W. Breaks, Precambrian Geoscience Section, OGS, continued a study of granite-related rare-metal pegmatite mineralization in the Separation Lake area.
- B) D. Stone, Precambrian Geoscience Section, OGS, completed a regional mapping program in the Eagle Rock Lake area.

KENORA DISTRICT--1999

Other studies included the following:

- C) K. Ford, Geological Survey of Canada, conducted a ground radiometric survey, with support from the Kenora District office, in the Separation Rapids rare-metal pegmatite field.
- D) A.R. Cruden, from the University of Toronto, as part of the Lithoprobe program, had a post-doctoral student examine the structural nature of the subprovincial boundaries, north of Kenora.
- E) D. Czeck, from the University of Minnesota completed field work on a post-graduate research project studying the kinematic fabrics of the boundary between the Quetico and Wabigoon subprovinces, east of Mine Centre.
- F) C. Cotter, from the University of Minnesota, at Morris, conducted field work in the High Lake area. Dr. Cotter has two graduate students studying the provenance of the Crowduck conglomerates.

Table 4. Publications received by the Kenora District Office in 1999.

Title	Author	Type and Year of Publication
Petrogenesis and Tectonic Evolution of the Lake of the Woods Greenstone Belt, Western Wabigoon Subprovince, Ontario, Canada	Ayer, J.A.	PhD thesis, Carleton University, Ottawa, 1998
Summary of Fieldwork and other Activities	Ayer, J.A., Baker, C.L., Kelly, R.I., Scott, G.M. and Thurston, P.C.	OFR 6000, 432p., 1999
Bedrock Compilation Map Series, NTS 62I, Selkirk	Bezys, R. et al	Manitoba Energy and Mines, 1:250 000, 1997
Report of Activities 1998, Resident Geologist Program, Red Lake-Kenora Districts	Blackburn, C.E., Hinz, P., Storey, C.C., Kosloski, L. and Ravnaas, C.B.	OFR 5987, 88p., 1999
Bedrock Compilation Map Series, NTS 52L, Pointe du Bois (Preliminary Edition)	Kowarchuk, D. and Weber, W.	Manitoba Energy and Mines, 1:250 000, 1987
Bedrock Compilation Map Series, NTS 62H, Winnipeg	McCabe, H.R. et al	Manitoba Energy and Mines, 1:250 000, 1987
Bedrock Compilation Map Series, NTS 52E, Kenora (Preliminary Edition)	McGregor, C.R. et al	Manitoba Energy and Mines, 1:250 000, 1987
Institute on Lake Superior Geology	Minnesota Geological Survey	45 th Annual Meeting, Parts I and II, 1999
Quaternary Geology, Lennon Lake Area	Morris, T. F.	OGS Map 2547, Scale 1:50 000, 1999
Quaternary Geology, Urmfreville Lake Area	Morris, T. F.	OGS Map 2548, Scale 1:50 000, 1999
Quaternary Geology of the Separation Lake Area, Northwestern Ontario	Morris, T. F.	OFR 5980, 90p., 1999
Precambrian Geology, Ignace Area	Stone, D., Hallé, J. and Chaloux, E.	OGS Map P. 3360, Scale 1:50 000, 1999
Precambrian Geology, Entwine Lake Area	Stone, D., Hallé, J. and Chaloux, E.	OGS Map P. 3400, Scale 1:50 000, 1999

ACKNOWLEDGEMENTS

The District Geologist would like to acknowledge the efforts of C.B. Ravnaas (District Support Geologist), C.C. Blackburn (Acting District Support Geologist), M. MacGregor (Clerical Support) and C.E. Blackburn (Acting Mineral Development Co-ordinator) for their efforts throughout the year in supporting the operations of the Kenora District office. Thanks to D.G. Laderoute for editing the report. Special thanks to C.E. Blackburn for his technical advice in the preparation of this report.

Table 5. Mineral deposits not being mined in the Kenora District in 1999.

Abbreviations					
AF.....	Assessment Files	MLS.....	Mining Lands, Sudbury		
CMH.....	Canadian Mines Handbook	MR	Mining Recorder		
GR	Geological Report	NM	The Northern Miner		
MDC.....	Mineral Deposit Circular	OFR.....	Open File Report		
MDIR	Mineral Deposit Inventory record	PC.....	Personal Communication		

Deposit Name/ NTS	Comm- odity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Bad Vermilion Lake-Seine Bay Prospect (52C/10NE)	Fe, Ti, V	1 270 000 tons of 15% TiO ₂ and 45% Fe; there is potential for 177 800 tons of titanium sponge.	Stephanna Resources Jan./96	NM 08/15/85, p.3 (Beaver Energy Resources)	Inactive, 17 claims
Bending Lake Prospect (52F/8SE)	Fe	Open pit reserves sufficient to maintain plant output of 2 million tons for 20 years. Main zone is 1500 m long by 300 m wide (grade of iron is unstated)	Noranda Mining and Exploration Inc.	MDIR AF	Inactive, patented claims MDIR file - K0133
Big Master (Kenwest Mine) (52F/7NE)	Au	Proven and Probable: 123 000 tons of 0.30 ounce Au per ton; Indicated: 600 000 tons of 0.22 ounce gold per ton. Probable: 25 000 tons @ 0.48 opt. 4 500 tons @ 0.58 opt. 8 500 tons @ 0.21 opt. Dump: 1 000 tons @ 0.25 opt.	Goldcorp. Inc., Toronto; c/o David Sannes PCKRG	CMH, 1988-89, p.92 (Canamerica Precious Metals Inc.) OFR 5332, vol. 1, Table 6.8	Inactive, patented claims HP366, HP373, HP301
Big Whopper Pegmatite (52 L/07SE)	Li, Cs, Rb	Preliminary resource estimated at 7,081,700 tonnes averaging 1.285% Li ₂ O and 0.346% Rb ₂ O over strike length of 600m to a maximum depth of 250 m.	CMH, 1999-00, p.52 (Avalon Ventures Ltd.)	CMH, 1999-00, p.52 (Avalon Ventures Ltd.)	Active, staked claims.
Bonanza Mine (52F/10NW)	Au	5 000 tons of 0.25 ounce Au per ton across an average width of 1-foot.	CMH, 1994-95, p.386 (Wiscan Resources Inc.)	Van Hone Gold Expl. Inc. AF	Inactive 59 claims K53304 (site)
Canadian Arrow (Dogpaw Lake) Prospect (52F/5SW)	Au	Indicated: 96 650 tons of 0.43 ounce Au per ton in 3 veins. Probable 30 000 tons @ 0.30 opt. Possible 70 000 tons @ 0.30 opt. Spec. 80 000 tons @ 0.30 opt.	CMH, 1994-95, p.84 (Canadian Arrow Mines Ltd.).	Canadian Arrow Mines Ltd., AF OFR 5332, vol.1, Table 4	Inactive 17 claims

KENORA DISTRICT--1999

Deposit Name/ NTS	Com- modity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Canamerica E Zone (52F/7NE)	Au	455 000 tonnes of 0.117 ounce Au per tonne indicated and inferred. 529 650 tonnes of 0.103 ounce Au per tonne indicated and inferred.	CMH, 1990-91, p.119 (Co-Maxx Energy Group Inc.)	NM 07/13/87, p.17(Canamerica Precious Metals Inc.) Cochrane Oil & Gas Ltd., AF	Inactive 45 claims
Cameron Lake Deposit (52F/5SE)	Au	Proven, possible, probable: 3 160 148 tons of 0.168 ounce Au per ton	CMH, 1995-96, p.275 (Nuinsco Resources Ltd.)	Nuinsco Resources Ltd.	Care and maintenance, 61 leased claims
Cedar Island Deposit (Cornucopia) Mikado Mines (52E/10SW)	Au	Preliminary reserves: 1 234 069 tonnes of 9.62 g/t Au	CMH, 1995-96, p.220 (Kenora Prospectors and Miners Ltd.)	CMH, 1995-96 p.220	Inactive, patented claims D212, D265
Dubenski Gold Prospect (52F/05SW)	Au	Drill-indicated resource of 355 286 tonnes grading 6.36 g/t calculated to a depth of 150 m.	P. Dubenski, Kenora PC	Press release, Avalon Ventures Ltd. and Consolidated Westview Resources Corp., November 18, 1998	Active, joint-venture option between Avalon Ventures Ltd. and Consolidated Westview Resources Corp. 22 leased claims.
Duport Mine (52E/11SE)	Au	Total geological reserves: 2 000 000 tons of 0.35 ounce Au per ton; Proven and Probable: 944 000 tons of 0.39 ounce Au per 450 tpd. Est pre- production cost \$52.8 million	CMH, 1995-96, p.111 (Consolidated Professor Mines Ltd.)	CMH, 1995-96 p.111	Active, patented claims S.170, K1332, K1333, K2374
Earngey-Linburg Occurrence (52E/9NW)	Au	50 m long by 5 m wide quartz vein assaying 1.42 ounce Au per ton across 7.5 feet and 0.37 ounce Au per ton across 9.7 feet.	Dean Pickell, Winnipeg, PC	OFR 5695, p.86	Inactive, patented claim K9333
Electrum Lake Occurrence Arsenic Zone (52E/11NE)	Au	97.5 m long by 1.76 m wide by 39.6 m deep (minimum) zone averaging 0.36 ounce Au per ton.	G. Pogson, Thunder Bay	OFR 5695, p.98	Inactive, staked claim 1220585
Electrum Prospect A-C Zones (Contact Zone) (52E/11NE)	Au, Cu	A zone-30 m long by 1.5 m wide by 45 m deep averaging 0.34 ounce Au per ton and 0.14% Cu B Zone-45 m long by 0.9 m wide by 61 m deep averaging 0.27 ounce Au per ton and 1% Cu C Zone-45 m long by 1.5 m wide by 30 m deep averaging 0.32 ounce Au per ton and 0.94% Cu 15 000 tons of 0.24 ounce Au per ton estimated in the C Zone.	Celyn Alcock, Kenora, Ontario	OFR 5695,p.101 Sherritt Gordon Mines Ltd., Kenora AF	Inactive, leased claims K23942, K23943

Deposit Name/ NTS	Com- modity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Electrum Prospect-- P Zone (Electrum Fault Zone or Porphyry Zone (52E/11NE)	Au	30.5 m long by 30.5 m wide by 3.4 m deep averaging 0.40 ounce Au per ton.	Celyn Alcock, Kenora, Ontario	OFR 5695, p.106	Inactive, leased claim K20695
Electrum Prospect- W Zone (Fault zone or West Zone) (52E/11 NE)	Au	61 m long by 2.1 m wide by 19.8 m deep averaging 0.23 ounce Au per ton. 100 000 tons of 0.33 ounce Au per ton in the P & W zones combined.	Celyn Alcock, Kenora, Ontario	OFR 5695,p.108 Laramide Resources Inc. Annual Report, 1987	Inactive, patented and leased claims K20696-K28663
Errington Prospect (52F/6SW)	Au	24 000 tons of 0.73 ounce Au per ton in a zone 450 feet long by 32 inches wide by 240 feet deep	Lawrence Mattson Linnstrom, Minn. U.S.A., MLS	MDC 16, p.16	Inactive, patented claims K7181, 7183, 7184, 7186
Evenlode Prospect (Eco Occurrence) (52E/11NE)	Mo, Au	126 000 tons of 0.68% MoS ₂ and 0.015 ounce Au per ton. Indicated: 200 000 tons of 0.63% MoS ₂ ; Inferred: 550 000 tons estimated to a depth of 800 feet.	Patented claims - D. Smerchanski. Staked claims - D. Meek	OFR 5695,p.114	Inactive, patented claims K8705, K8707, staked claims 1229467, 1229468
Flambeau Lake Prospect (52F/10NW)	Au	Diamond drilling partially outlines a zone with potential for 572 000 tonnes (gold grade unstated).	Alex Kozowy, Dryden, PC	AF	Inactive, patented claim AL88
Foley Mine (52C/10NE)	Au	40 000 tons @ 0.5 opt proven/probable; 400 000 tons @ 0.5 opt speculative.	R. Cone, Fort Frances	NM 09/25/80 (Seaforth Mines Ltd.) OFR 5539, p.194	Inactive, patented claims K475101, K475102, K475103
Gaffney Prospect (52F/7SW)	Au	300 000 tons of 0.15 ounce Au per ton .	San Paulo Expl. Inc. (CMH, 1990-91, p.393)	CMH, 1990-91, p.393	Inactive, patented K3594, 3595
Golden Star Mine (52C/10NE)	Au	10 000 tons of 0.45 ounce Au per ton 20 000 tons of 0.42 ounce Au per ton and 35 000 tons of 0.15 ounce Au per ton in tailings dump.	PIRP Holdings Inc., AF	OFR 5512, p.44 MDC 16, p.20	Inactive, patented claim AL116, leased claim K44632
High Lake Prospect (52E/11NE)	Cu, Mo, Au	2000-foot long by 250-wide zone containing assay values of 0.10% to 1.35% Cu and 0.01 to 0.05 ounce Au per ton .	Celyn Alcock, Kenora, Ontario	GR 41, p.46	Inactive, leased claim K32307
Kenbridge Prospect (52F/5NE)	Ni, Cu	3 271 390 tons of 1.06% Ni and 0.54% Cu.	CMH, 1986-87, p.209, (Falconbridge Limited)	GR 111, p.44	Inactive, patented claims K6672, K6634, K6635
Mavis Lake Prospect (52F/15SE)	Li, Ta	500 000 tons of 1% Li ₂ O.	CMH, 1995-96, p.262, (New Claymore Resources Ltd.).	OFR 5718, p.151	Inactive, leased claims K498288, K498289, K498290, K498292, K498308, K498140
Maybrun Mine (52F/5NE)	Cu, Au	2 824 825 tons of 1.18% Cu and 0.08 ounce Au per ton including 1 508 454 tons of 1.48% Cu and 0.11 ounce Au per ton.	CMH, 1995-96, p.108 (Consolidated Maybrun Mines Limited)	GR 111, p.36	Inactive, property on care and maintenance, patented claims

KENORA DISTRICT--1999

Deposit Name/ NTS	Com- modity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
					K15364-K15381, K15524- K15527
Mironsky Prospect (52C/11NE)	Cu	400 feet long by 35 feet wide zone to a minimum depth of 300 feet averaging 0.53 to 1.01% Cu. 300 000 tons of 0.8% Cu (estimated).	G. Royer	GR 115, p.58	Inactive, staked claim 1195707
New Campbell Island Mines (Richard Lake) Prospect (52F/13SW)	U	650 000 tons of 0.10% U ₃ O ₈ in a zone 700 feet long by 10 feet wide and 1000 feet deep.	Unknown	GR 130, p.46	Inactive, patented claim K18761
Norpax (Reynar Lake) Prospect (52L/6NE)	Ni, Cu	1 010 000 tons of 1.2% Ni and 0.5% Cu.	CMH, 1995-96, p.149 (Falcon Point Resources Ltd.)	Norpax Nickel Mines Ltd., AF	Inactive, patented claims KRL350101, KRL34767
Northrock (South Grassy) Prospect - Beaver Pond Zone (52C/11NE)	Cu	1 020 458 tons of 1.17% Cu over a strike length of 400 m including 265 230 tons of 2.08% Cu over a length of 300 m (all estimates valid to a vertical depth of 91m).	Nor-Norock Mining Company Limited	OFR 5512, p.50	Inactive, leased claims K12314, K12315, K12319, K12320
Olive (Preston) Mine (52C/15SE)	Au	12 5000 tons of 0.34 ounce Au per ton in 2 mineralized shoots and 1100 tons of broken ore averaging 0.31 ounce Au per ton in the second level stope.	CMH, 1995-96, p.269, (Noront Resources Inc.)	NM 05/18/87, p.6, NM 06/29/87, p.21 (HSK Minerals Ltd.), AF	Inactive, leased claims K475146, K475190-193, K475269
Purdex Prospect (A-D Zones) (52E/11NE)	Au	76 500 tons of 0.308 ounce Au per ton (combined indicated tonnage in 4 zones). 241 000 tons at 0.226 ounce Au per ton in the P,A,B and C zones.	CMH,1995-96, p.233, (Locke Riche Minerals Ltd.)	OFR 5695, p.273 CMH, 1995-96 p.233, (Locke Riche Minerals Ltd.)	Inactive, patented claims K25130-131
Regina Mine (52E/8NE)	Au	Speculative 19 650 tons of 0.44 opt. 30 000 tons at 0.106 ounce Au per tons in tailings.	Unknown	Lodi Metals Inc. AF; NM 07/25/88, p.7 (Sweeney Gold Corp.)	Inactive, patented claims P566-67
Scramble (Homestake) Mine (52E/16SW)	Au	1200- to 1500-foot long by 12 foot wide zone averaging 0.15 ounce Au per ton. 150 000 tons at 0.24 opt and 1500 at 0.24 opt and 70 000 ounces (using cut-off @ 0.05 opt.) drill indicated.	Boise Cascade Corporation, PC	NM 07/25/88 (Madeline Mines Ltd.) CIMM, Dist.4 Field Trip Guidebook, p.44	Inactive, Jaffray Twp., Con.6, Lot 13 and 14
Tabor Lake Mine (52F/9SW)	Au	Possible 14 000 @ 0.41 opt; Speculative 3000 @ 0.41 opt.	Sulpetro Minerals Ltd., AF	OFR 5332, vol.1, Table 12	Inactive, 37 patented claims, mine site on K502044
Thunder Lake Deposit (52 F/15SE)	Au	Drill-indicated resource of 3.78 million tonnes averaging 7.02 grams per tonne Au (equivalent to 853,000 ounces Au)	CMH, 1999-00, p.125 (Corona Gold Corp.)	CMH, 1999-00, p.125 (Corona Gold Corp.)	Inactive, patented and staked claims.

Deposit Name/ NTS	Com- modity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Vanlas Prospect (Kidd Zone) (52F/10NW)	Au	100 000 tons of 0.20 ounce Au per ton	Power Expl. Inc. Annual Report, 1988	Power Expl. Inc. AF	Inactive, patented claim K70627
Victor Island Prospect (52F/5SE)	Au	Drill indicated reserves: 300 000 tons at 0.12 ounce Au per ton to a depth of 700 feet.	CMH, 1997-98 p.346 (Nuinsco Resources Ltd.)	MP 128, p.16	Inactive, patented claim K4712 Claims 690655, 718785
Virginia Prospect (52F/5NE)	Au	100-foot wide zone averaging 0.10 ounce Au per ton.	C.C. Hart, Villanova, Penn., U.S.A.	G111, p.40	Inactive, patented claim F.M.73A
Wind Bay Prospect (52C/10 NW)	Zn, Cu	1300 m long by 50 m wide zone hosts several 10 m wide mineralized lenses. Typical diamond drill hold intersections assayed 1.5% Zn, 0.2% Cu and 1.1% Zn, 0.09% Cu across 7 m and 8.6 m, respectively.	Open for staking	OFR 5512, p.89	Inactive
Witch Bay Occurrence (52E/9SE)	Au	8.2 g/t Au to 29.5 g/t Au across 30 to 36 cm for a length of 240 m.	G. Pogson, Thunder Bay	OFR 5695, p.370	Claim 1220532

REFERENCES

- Beard, R.C. and Garratt, G.L. 1976. Gold Deposits of the Kenora-Fort Frances Area, Districts of Kenora and Rainy River; Ontario Division of Mines, Mineral Deposits Circular 16, 46p.
- Blackburn, C.E. 1981. Geology of the Boyer Lake-Meggisi Lake Area, District of Kenora; Ontario Geological Survey, Report 202, 107p.
- Blackburn C.E. 1982. Geology of the Manitou Lakes Area, District of Kenora, (Stratigraphy and Petrochemistry); Ontario Geological Survey, Report 223, 61p.
- Blackburn, C.E., Hailstone, M.R., Parker, J. and Storey, C.C. 1989. Kenora Resident Geologist's District - 1988; p.3-46 in Report of Activities 1988, Resident Geologists, edited by K.G. Fenwick, P.E. Giblin, and A.E. Pitts; Ontario Geological Survey, Miscellaneous Paper 142, 391p.
- Blackburn, C.E., Johns, G.W., Ayer, J.A. and Davis, D.W. 1991. Wabigoon Subprovince; in Geology of Ontario; Ontario Geological Survey, Special Volume 4, Part 1, p.303-382.
- Blackburn, C.E. and Hinz, P. 1995. Kenora Resident Geologist's District - 1994; in Report of Activities 1994, Resident Geologists; Ontario Geological Survey, Open File Report 5921, p.19-41.
- Blackburn, C.E., Hinz, P., Storey, C.C., Kosloski, L. and Ravnaas, C.B. 1999. Report of Activities 1998, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts; Ontario Geological Survey, Open File Report 5987, 88p.
- Breaks, F.W., Bond, W.D., McWilliams, G.H., Gower, C.F. and Findlay, D. 1975a. Operation Kenora-Sydney Lake, Oak-Indian lakes sheet, District of Kenora; Ontario Geological Survey, Preliminary Map P.1029, scale 1:63 360.

KENORA DISTRICT--1999

- Breaks, F.W., Bond, W.D., McWilliams, G.H., Gower, C.F., Findlay, D. and Stone, D. 1975b. Operation Kenora-Sydney Lake, Umfreville-Separation lakes sheet, District of Kenora; Ontario Geological Survey, Preliminary Map P.1028, scale 1:63 360.
- Breaks, F.W. and Tindle, A.G. 1997. Rare-metal exploration potential of the Separation Lake area; an emerging target for Bikita-type mineralization in the Superior Province of Ontario; Ontario Geological Survey, Open File Report 5966, 27p.
- Colvine, A.C. and Marmont S. 1981. Early Precambrian Porphyry Deposits; p.242-247 in Summary of Field Work, 1981, Ontario Geological Survey, Miscellaneous Paper 100, 255p.
- Colvine, A.C. and Sutherland, I.G. 1979. Early Precambrian Porphyry Deposits; p.230-232, in Summary of Field Work 1979, Ontario Geological Survey, Miscellaneous Paper 90, 245p.
- Davies, J.C. 1965. Geology of the High Lake-Rush Bay area, District of Kenora; Ontario Division of Mines, Report 41, 57p.
- Davies, J.C. 1973b. Geology of the Atikwa Lake area, District of Kenora; Ontario Division of Mines, Report 111, 57p.
- Davies, J.C. and Morin, J.A. 1976. Geology of the Cedartree Lake area, District of Kenora; Ontario Division of Mines, Report 134, 52p.
- Edwards, G.R. 1980. Geology of the Schistose Lake area, District of Kenora; Ontario Geological Survey, Report 194, 67p.
- Edwards, G.R. 1983a. Geology of the Bethune Lake area, Districts of Kenora and Rainy River; Ontario Geological Survey, Report 201, 59p.
- Edwards, G.R. 1983b. Geology of the Straw Lake area, districts of Kenora and Rainy River; Ontario Geological Survey, Report 222, 67p.
- Hinz, P., Landry, R.M. and Gerow, M.C. 1994. Dimension stone occurrences and deposits in northwestern Ontario; Ontario Geological Survey, Open File Report 5890, 191p.
- Parker, J.R., Blackburn, C.E. and Perrault, M. 1988. Gold Mineralization in the Manitou-Stormy Lakes Greenstone Belt, Northwestern Ontario: Nature and Timing; lecture, Ontario Mines and Minerals Symposium, Toronto, Ontario, December 12-14.
- Pedora, J.M. 1976. Mineralization of the High Lake Pluton and Adjacent Country Rocks; unpublished MSC thesis, University of Manitoba, Winnipeg, Manitoba, 60p.
- Smith, P.M. 1987. Geology of the High Lake Area, Ewart Township, District of Kenora; p.61-65, in Summary of Field Work and Other Activities 1987, Ontario Geological Survey, Miscellaneous Paper 137, 429p.
- Smith, P.M. 1993. Precambrian Geology, Vista Lake area; Ontario Geological Survey, Report 282, 84p.

Metric Conversion Table

Conversion from SI to Imperial			Conversion from Imperial to SI		
SI Unit	Multiplied by	Gives	Imperial Unit	Multiplied by	Gives
LENGTH					
1 mm	0.039 37	inches	1 inch	25.4	mm
1 cm	0.393 70	inches	1 inch	2.54	cm
1 m	3.280 84	feet	1 foot	0.304 8	m
1 m	0.049 709	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	1.609 344	km
AREA					
1 cm ²	0.155 0	square inches	1 square inch	6.451 6	cm ²
1 m ²	10.763 9	square feet	1 square foot	0.092 903 04	m ²
1 km ²	0.386 10	square miles	1 square mile	2.589 988	km ²
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
VOLUME					
1 cm ³	0.061 023	cubic inches	1 cubic inch	16.387 064	cm ³
1 m ³	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m ³
1 m ³	1.307 951	cubic yards	1 cubic yard	0.764 554 86	m ³
CAPACITY					
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	4.546 090	L
MASS					
1 g	0.035 273 962	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 747	ounces (troy)	1 ounce (troy)	31.103 476 8	g
1 kg	2.204 622 6	pounds (avdp)	1 pound (avdp)	0.453 592 37	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	907.184 74	kg
1 t	1.102 311 3	tons (short)	1 ton (short)	0.907 184 74	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	1016.046 908 8	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	1.016 046 90	t
CONCENTRATION					
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

	Multiplied by	
1 ounce (troy) per ton (short)	31.103 477	grams per ton (short)
1 gram per ton (short)	0.032 151	ounces (troy) per ton (short)
1 ounce (troy) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per ton (short)

Note: Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.